Vol. 1016 Number 3

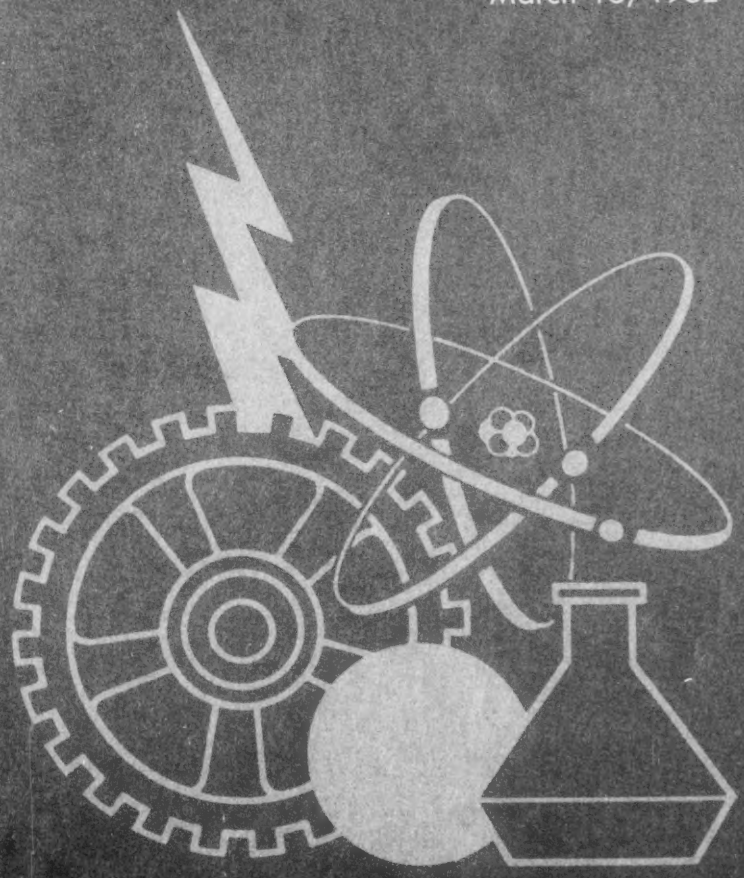
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

March 16, 1982



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

March 16, 1982 Volume 1016 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Fees	
Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,702,843, Re. S.N. 338,011, Filed Jan. 8, 1982, Cl. 525/361, NITRITE, NITRATE AND SULFATE ESTERS OF POLYHYDROXY POLYMERS, Richard G. Schweiger, Owner of Record: *Inventor,* Attorney or Agent: Mario A. Martella, Ex. Gp.: 144

3,705,608, Re. S.N. 325,274, Filed Nov. 27, 1981, Cl. 139/435, METHOD FOR TRANSPORTING A WEFT THREAD THROUGH A WEAVING SHED AND A LOOM FOR PERFORMING SAID METHOD, Geert Jan Vermeulen, Owner of Record: *Ruti-Te Strake B.V., Deurne, Netherlands,* Attorney or Agent: William L. Mathis, Ex. Gp.: 353

3,776,991, Re. S.N. 288,294, Filed July 30, 1981, Cl. 264/89, INJECTION BLOW MOLDING METHOD, Paul Marcus, Owner of Record: *Inventor,* Attorney or Agent: John Kurucz, Ex. Gp.: 147

3,979,296, Re. S.N. 334,559, Filed Dec. 28, 1981, Cl. 210/324, FILTER, Wendel Bastgen, Owner of Record: *Inventor,* Attorney or Agent: Alan K. Roberts, et al., Ex. Gp.: 176

4,171,284, Re. S.N. 271,565, Filed Nov. 25, 1981, Cl. 252/429B, CATALYST SYSTEM, Nikolaous K. Balint, Owner of Record: *Standard Oil Co., (Indiana), Chicago, Ill.,* Attorney or Agent: William T. McClain, et al., Ex. Gp.: 117

4,176,316, Re. S.N. 299,469, Filed Sept. 4, 1981, Cl. 455/32, SECURE SINGLE SIDEBAND COMMUNICATION SYSTEM USING MODULATED NOISE SUBCARRIER, Louis A. Derosa, et al., Owner of Record: *International Telephone and Telegraph Corp., Nutley, N.J.,* Attorney or Agent: Paul W. Hemminger, et al., Ex. Gp.: 211

4,178,157, Re. S.N. 328,027, Filed Dec. 7, 1981, Cl. 55/155, METHOD FOR MANUFACTURING A FILTER OF ELECTRICALLY CHARGED ELECTRET FIBER MATERIAL AND ELECTRET FILTERS OBTAINED ACCORDING TO SAID METHOD, Jan Van Turnhout, et al., Owner of Record: *Minnesota Mining and Manufacturing Co., Saint Paul, Minn.,* Attorney or Agent: Cruzan Alexander, et al., Ex. Gp.: 177

4,180,400, Re. S.N. 331,314, Filed Dec. 16, 1981, Cl. 75/235, COATED CEMENTED CARBIDE BODY AND METHOD OF MAKING SUCH A BODY, Ulf K. H. Smith, et al., Owner of Record: *Sandvik Aktiebolag, Sandviken, Sweden,* Attorney or Agent: Ronald Grudziecki, et al., Ex. Gp.: 223

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

2,968,164, Reexam. No. 90/000,158, Requested: Feb. 12, 1982, Cl. 62/74, METHOD OF GENERATING SNOW, Alden W. Hanson, Owner of Record: *Inventor,* Attorney or Agent: James B. Venderkelen, Ex. Gp.: 342, Requester: Dewey Electronic Corp., Oakland, N.J.

4,053,916, Reexam. No. 90/000,159, Requested: Feb. 16, 1982, Cl. 357/23 SILICON ON SAPPHIRE MOS TRANSISTOR, James R. Cricchi, et al., Owner of Record: *Westinghouse Electric Corp., Pittsburgh, Pa.,* Attorney or Agent: C. R. Renz, Ex. Gp.: 250, Requester: Westinghouse Electric Corp., Pittsburgh, Pa.

4,200,932, Reexam. No. 90/000,157 Requested: Feb. 11, 1982, Cl. 364/519, MEANS FOR THE CONTROL AND REGULATION OF THE PRINTING PROCESS ON PRINTING PRESSES, Peter Schramm, et al., Owner of Record: *Roland Offsetmaschinenfabrik, Faber & Schleicher, AG Fed. Rep. Germany* Attorney or Agent: Richard L. Voit, Ex. Gp.: 230, Heidelberger Druckmaschinen A.G., Heidelberg, Germany

4,218,011, Reexam. No. 90/000,160, Requested: Feb. 17, 1982, Cl. 235/375, COUPON CONTROLLED METERING DEVICE, Luther G. Simjian, Owner of Record: *Inventor,* Attorney or Agent: Ervin B. Steinberg, Ex. Gp.: 234, Requester: Pitney Bowes, Inc., Stamford, Conn.

4,258,252, Reexam. No. 90/000,162, Requested: Feb. 17, 1982, Cl. 235/432, CHECK CONTROLLED METERING DEVICE, Luther G. Simjian, Owner of Record: *Inventor,* Attorney or Agent: Ervin B. Steinberg, Ex. Gp.: 230, Requester: Pitney Bowes, Inc., Stamford, Conn.

Errata

"All reference to Patent No. 4,308,007 to Winfried Buschulte of Germany for BLUE-FLAME OIL BURNER appearing in the Official Gazette of Dec. 29, 1981, should be deleted since no patent was granted".

"All reference to Patent No. 4,316,429 to Shawn R. Sidwell of Okla. for SPRAY PAINTING SHIELD appearing in the Official Gazette of Feb. 23, 1982, should be deleted since no patent was granted".

PATENT NOTICES

Certificates of Correction for the Week of Mar. 16, 1982

D. 257,553	4,277,409	4,296,941	4,304,768
D. 261,268	4,277,644	4,297,100	4,304,958
3,883,516	4,280,742	4,297,177	4,304,966
3,932,458	4,281,053	4,297,194	4,305,042
4,157,973	4,281,695	4,297,624	4,305,060
4,160,202	4,282,127	4,297.835	4,305,081
4,182,048	4,282,688	4,297,930	4,305,214
4,212,888	4,282,796	4,297,970	4,305,432
4,214,500	4,283,342	4,298,004	4,305,533
4,227,654	4,283,396	4,298,074	4,305,549
4,231,063	4,283,413	4,298,092	4,305,598
4,233,722	4,286,226	4,298,192	4,305,718
4,235,006	4,286,979	4,298,563	4,305,934
4,236,924	4,287,075	4,299,969	4,306,073
4,237,014	4,287,602	4,300,765	4,306,317
4,240,517	4,288,804	4,300,836	4,306,356
4,241,114	4,289,809	4,301,517	4,306,518
4,244,396	4,290,062	4,301,628	4,306,682
4,245,248	4,290,576	4,301,723	4,306,896
4,247,619	4,291,424	4,301,731	4,307,106
4,251,271	4,292,136	4,302,570	4,307,239
4,254,203	4,292,779	4,302,955	4,307,363
4,254,813	4,293,361	4,303,176	4,307,405
4,260,521	4,293,924	4,303,203	4,307,436
4,266,907	4,294,193	4,303,227	4,307,521
4,267,072	4,294,737	4,303,260	4,307,618
4,267,147	4,294,745	4,303,374	4,308,012
4,269,776	4,294,966	4,303,486	4,308,099
4,270,548	4,295,182	4,303,587	4,308,128
4,271,835	4,295,234	4,304,078	4,308,901
4,272,769	4,295,889	4,304,321	4,310,230
4,273,856	4,296,066	4,304,680	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 6, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-23-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-18-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-04-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-19-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-24-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-29-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	7-03-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-24-80
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	10-02-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	4-14-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-27-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-25-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	3-31-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	5-30-80

Expiration of patents: The patents within the range of numbers indicated below expire during February 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,167,778 to 3,171,130, inclusive

Plant Patents ..... Numbers 2,468 to 2,485 inclusive

PATENT EXAMINING CORPS

BYRON D. HOLTSINGER, Medical Commissioner
WILLIAM FEDERMAN, Deputy Medical Commissioner

CONDITIONS OF PATENT APPLICATIONS AS OF February 8, 1892

REISSUES

MARCH 16, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,881
WINCH

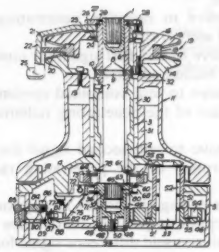
Richard D. J. Huggett, Horndean, and William Cook, Cowplain, both of England, assignors to Lewmar Marine Limited, Hampshire, England

Original No. 4,208,036, dated Jun. 17, 1980, Ser. No. 928,159, Jul. 26, 1978. Application for reissue Nov. 6, 1980, Ser. No. 204,705

Claims priority, application United Kingdom, Jul. 27, 1977, 31611/77

Int. Cl.³ B66D *1/30*

U.S. Cl. 254—345 **11 Claims**



11. A manually powered winch comprising:

a winch drum rotatable about a central axis;

drive input;

at least first, second and third drive trains of respectively different drive ratios between the drive input and winch drum;

means for causing successive driving engagement of said second drive train and disengagement of said first drive train upon a first reversal of direction of rotation of the drive input and driving engagement of said third drive train and disengagement of said second drive train upon a second reversal of direction of rotation of the drive input to drive the drum in one direction of rotation; and

means unaffected by a first reversal of the direction of rotation of the drive input engaging said causing means and operable to override and prevent the engagement of said third train by said causing means so that said first train is engaged upon said second reversal of direction of the drive input.

Re. 30,882
PNEUMATIC CARRIER WITH ADJUSTABLE CLOSURE MECHANISM

Robert S. Leavelle, 19631 Quiet Bay La., Huntington Beach, Calif. 92648

Original No. 4,149,685, dated Apr. 17, 1979, Ser. No. 826,552, Aug. 22, 1977. Application for reissue Sep. 10, 1980, Ser. No. 185,980

Int. Cl.³ B65G *51/06*

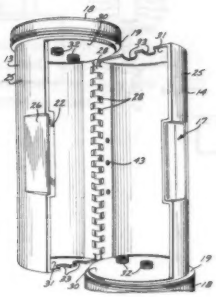
U.S. Cl. 406—186 **2 Claims**

1. A carrier for a pneumatic tube conveyor system comprising:

a hollow cylindrical hull formed of opposing identical mating sections both having generally semi-cylindrical walls with longitudinal edges, one edge of each wall being formed for a hinge connection with the other section and the edges of said walls are formed with longitudinally centered symetrical indented shelves each formed with a longitudinally aligned radial lip;

a pair of opposing circular end pads with air gaskets associated therewith affixed to the opposite ends of said cylindrical hull;

a closure mechanism mounted on the indented shelf of one of said opposing mating hull sections and having a releasable catch spring biased toward said hull that when engaged, extends over the radial lip of the opposing hull section to entrap both of said radial lips to maintain said hull in closed condition, and including a [set screw] *closure limiting member* for [adjustably] limiting the extent of radial movement of said catch having an engageable portion appearing at the underside of the shelf upon which said closure mechanism is mounted, [and one of] said hull sections [is perforated adjacent to said hinge in longitudinal alignment with said closure mechanism, thereby] allowing access to said [set screw] *closure limiting member* by [an elongated] *a suitable* engaging tool [which can be inserted through said perforation to extend across the interior of said hull] to effectuate adjustment of said [set screw with said hull sections closed together] *closure limiting member.*



Re. 30,883
METHOD OF PRODUCING SYNTHETIC QUARTZ GLASS

Karlheinz Rau, Hanau; Fritz Simmat, Gelnhausen; Albert Mühlich, Frankfurt, and Norbert Treber, Kriftel, all of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Original No. 4,162,908, dated Jul. 31, 1979, Ser. No. 874,965, Feb. 3, 1978. Continuation of Ser. No. 713,541, Aug. 11, 1976, abandoned. Application for reissue Feb. 13, 1980, Ser. No. 121,078

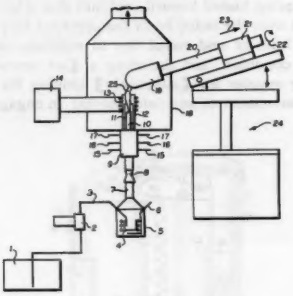
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536457; Aug. 16, 1975, 2536572

Int. Cl.³ C03C *17/00, 17/02, 25/02*

U.S. Cl. 65—60.51 **12 Claims**

1. A method for forming a coating of a fluorine containing synthetic OH ion-free quartz glass on a refractory support which comprises passing a hydrogen-free silicon compound, gaseous oxygen and vaporous CCl_2F_2, $CClF_3$ or CF_4 in a hydrogen free gas stream through an induction coupled plasma burner whereby said hydrogen-free silicon compound reacts with said oxygen to form synthetic OH ion-free quartz glass, the amount of said CCl_2F_2, $CClF_3$ or CF_4, passed through said burner, being sufficient to yield [a] fluorine [content in the quartz glass] in an amount of at least 500 grams per kg of

quartz to be produced whereby there is formed a fluorine-doped synthetic OH ion-free quartz glass and depositing said



fluorine-doped synthetic OH ion-free quartz glass as a coating on a refractory support.

Re. 30,884

ON-LINE SYSTEM FOR MONITORING SHEET MATERIAL ADDITIVES

Alexander Buchnea, Downsview, Canada, assignor to Sentrol Systems Ltd., Downsview, Canada

Original No. 4,081,676, dated Mar. 28, 1978, Ser. No. 751,312, Dec. 17, 1976. Application for reissue Feb. 7, 1980, Ser. No. 119,389

Int. Cl.³ G01N *23/223*

U.S. Cl. 250—272 **15 Claims**

16. Apparatus for measuring the content of first and second additives in a sheet material, said first additive exhibiting relatively low-energy X-ray fluorescence, said second additive exhibiting relatively high energy X-ray fluorescence, said apparatus comprising:

means for irradiating the sheet material with X-ray radiation of a sufficiently high energy level to cause said second additive to emit fluorescent radiation;

means responsive to said fluorescent radiation for providing a first signal;

means responsive to radiation penetrating said sheet for providing a second signal;

means responsive to said first signal for computing the content of said second additive;

means responsive to said computed content for estimating the absorption of the penetrating radiation by said sheet material;

means responsive to said second signal for computing the actual absorption of the penetrating radiation by said material;

means for comparing the actual absorption with the estimated absorption to provide a difference signal;

means responsive to said difference signal for computing the content of said first additive; and

means responsive to said computed first additive content for correcting said computed second additive content.

PLANT PATENTS

GRANTED MARCH 16, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,830

ROSE PLANT

Dorothy J. S. Bailey, Bakersfield, Calif., assignor to San Joaquin Rose Co., McFarland, Calif.

Filed Sep. 8, 1980, Ser. No. 185,376

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as shown and described, characterized particularly by large, many petaled flowers of ivory and red coloring borne on a vigorous, upright growing plant.

PATENTS

GRANTED MAR. 16, 1982

ERRATA

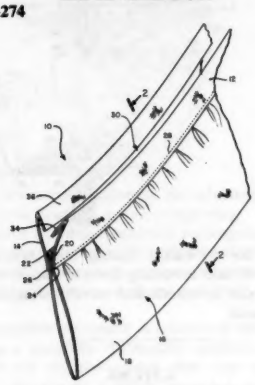
For CLASS	See PATENT NO.
441–025	4,319,372
376–247	4,319,958
376–245	4,319,959
376–272	4,319,960
376–260	4,319,961
524–014	4,320,036
523–142	4,320,037
523–216	4,320,038
525–054	4,320,039
524–459	4,320,040
524–503	4,320,041
523–144	4,320,042
523–144	4,320,043
524–413	4,320,044
523–523	4,320,045
524–083	4,320,046
523–457	4,320,047
523–333	4,320,048
524–094	4,320,049
524–591	4,320,220
527–501	4,320,223
422–186	4,320,301
372–090	4,320,358
372–018	4,320,359
375–017	4,320,499
307–110	4,320,505

PATENTS

GRANTED MARCH 16, 1982

GENERAL AND MECHANICAL

4,319,361
ONE STEP BINDING TAPE
Bruce A. Prince, Harrison, N.Y., assignor to The Prince Group, Inc., New York, N.Y.
Filed Nov. 9, 1979, Ser. No. 92,998
Int. Cl.[3] A41D *27/00*
U.S. Cl. 2—274 **3 Claims**



1. A binding tape for use by the home sewer and the like for a one-step alignment with and sewing to the edge of material to be trimmed, comprising:

a front tape portion comprising an elongated generally rectangular strip of fabric cut at a bias to the direction of the threads used for its weaving;

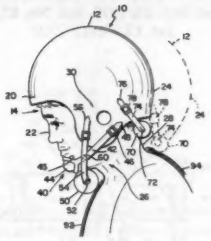
a rear tape portion comprising an elongated generally rectangular strip of fabric cut at a bias to the direction of the threads used for its weaving;

A base portion of decorative trim material folded over upon itself to form an open-ended trim;

said front and rear tape portions respectively having upper and lower elongated edges; the lower edges of said front and rear tape portions being in spaced relationship to the upper edges of said base portion on each side thereof whereby the lower portion of said front and rear tape portions are in face-to-face contact with the upper portion of a respective one of the panels forming said folded-over base portion; and at least one row of stitching extending through said front and rear and base portions to secure said portions together, whereby said front and rear tape portions extend upwardly from said base portion to form legs of a bifurcated envelope operable to receive therein the material to be trimmed; the upper edges of said front and rear tape portions being folded over in an inwardly direction to provide a reinforced sewing surface through which stitches may extend to secure together said binding tape and the material to be trimmed.

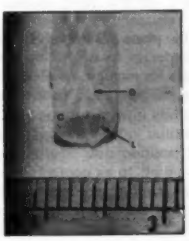
4,319,362
PROTECTIVE NECK APPARATUS
Donald N. Ettinger, 5310 Lance Dr., Knoxville, Tenn. 37919
Filed Oct. 29, 1979, Ser. No. 89,599
Int. Cl.[3] A42B *3/02*
U.S. Cl. 2—415 **13 Claims**

1. In a protective head apparatus of the type worn by athletes having a generally spherial shaped shell with a cavity for receiving a wearer's head, cut-away portions for exposing the wearer's face and neck, and a chin strap for securing the shell to the wearer's head, the improvement comprising means removably carried by the protective head apparatus for limiting forward and downward movement of the wearer's head to protect the wearer from hyperflexion of the neck, the limiting means including a generally cylindrical-shaped pad constructed of a flexible material and another strap for securing



the pad against a surface beneath the wearer's chin, the chin strap and the other strap being connected to form a single chin-engaging unit, and means for removably fastening the chin-engaging unit to the shell.

4,319,363
VASCULAR PROSTHESES
Vettivetpillai Ketharanathan, 35 Degraves St., Parkville, Victoria, Australia
Filed May 23, 1979, Ser. No. 41,620
Claims priority, application Australia, May 23, 1978, PD4475
Int. Cl.[3] A61F *1/00*
U.S. Cl. 3—1.4 **16 Claims**



5. A method of producing a vascular prosthesis suitable for use as a surgical graft in a human patient, comprising the steps of:

implanting a rod or tube in the body of a living non-human, host animal at such a location as to cause growth of Type I collagenous tissue thereon;

allowing said collagenous tissue to grow on the implanted rod or tube to form a coherent wall of said tissue;

removing the rod or tube with said coherent wall of tissue from the body of the host animal;

subjecting said coherent wall of collagenous tissue to glutaraldehyde tanning in order to produce cross-linking of collagen fibrils therein so as to increase the strength of the wall and also to impart immunological inertness and sterility thereto; and

removing the rod or tube from within the coherent wall of collagenous tissue at any time subsequent to the removal of the rod or tube and coherent wall of collagenous tissue from the body of the host animal.

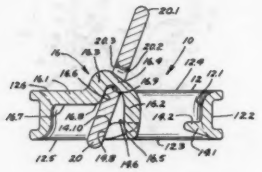
16. A vascular prosthesis suitable for use as a surgical graft in a human patient, comprising:

a coherent tubular wall of non-human Type I collageous tissue which has been subjected to glutaraldehyde tanning so as to comprise cross-linked collagen fibrils.

4,319,364
PIVOTING DISC HEART VALVE

Robert L. Kaster, 2730 Vagabond La., Plymouth, Minn. 55447, assignor to Robert L. Kaster, Plymouth, Minn.

Filed Oct. 24, 1979, Ser. No. 87,917
Int. Cl.[3] A61F *1/22*
U.S. Cl. 3—1.5 **12 Claims**



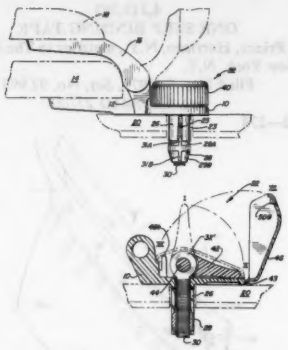
1. A prosthetic heart valve comprising:
an annular valve body including an inner wall and a substantially circular blood flow passage therethrough; a disc occluder including a central aperture and pivotable between occluding and non-occluding positions in said blood flow passage; disc guide strut means extending substantially radially inward from said valve body and including a U-shaped portion extending first downstream and then upstream, through said central aperture of said disc occluder and terminating in a disc guide extending upstream coaxially with said blood flow passage, said disc guide strut means including cross member means for limiting downstream movement of said disc occluder from said valve body and integral pivot means, said pivot means including an upstream facing surface means extending parallel with the plane of said valve body and the plane of said disc occluder in its occluding position and a pivot open stop means for engaging with said disc occluder in its non-occluding position; aand further opposing pivot projections projecting inwardly along a chord from said inner wall of said annular valve body and including downstream facing closed position disc stop surfaces; whereby said disc occluder pivots to an occluding position in response to an upstream pressure gradient across said heart valve on said pivot projections and said central aperture of said disc occluder is engaged by said disc guide, and whereby said disc occluder pivots to a non-occluding position in response to a downstream pressure gradient across said heart valve and said central aperture of said disc occluder is engaged and guided by said cross member means and said pivot open stop means.

4,319,365
NO TOOL TOILET SEAT HARDWARE

Richard A. Bemis, Sheboygan, and Gordon Kelly, Elm Grove, both of Wis., assignors to Bemis Manufacturing Company, SheboyganFalls, Wis.

Filed Feb. 11, 1980, Ser. No. 120,133
Int. Cl.[3] A47K *13/12*
U.S. Cl. 4—236 **16 Claims**

1. An apparatus for attaching a toilet seat to a commode, said commode defining at least one mounting hole, comprising:
(a) a base hingedly carrying said seat for joining said seat to said commode, said base resting on said commode, the upper portion of said base having an integral hinge post for coupling said seat to said base, the lower portion of said base carrying a stem disposed within said mounting hole, said stem having longitudinal bore extending therethrough and defining a slit extending from the lower end thereof to a point intermediate the ends thereof to split the wall of said stem along the length of said slit; and
(b) removable bolt means operable from the seat side of said

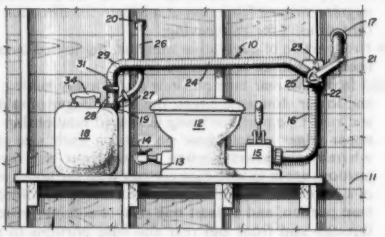


commode for outwardly flaring said stem against the periphery of said mounting hole to snugly engage said stem with said commode and thereby attach said base to said commode.

4,319,366
WASTE STORAGE APPARATUS

Roupen Baker, Jr., Governors Way, Barnstable, Mass. 02630, and Michael N. Botvin, 8 Roseland Ter., Marstons Mills, Mass. 02648

Filed Feb. 7, 1980, Ser. No. 119,446
Int. Cl.[3] B63B *29/14*
U.S. Cl. 4—323 **3 Claims**



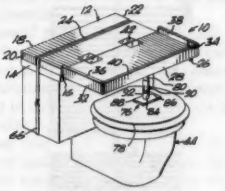
1. Waste storage apparatus for use with a boat head having a first conduit connected from the head to an inlet through-hull fitting, having a pump, and having a second conduit leading from the pump to an outlet through-hull fitting, comprising:
(a) a container formed of transparent flexible polymer having a threaded nozzle, the container being of a size to permit it to be easily carried when full and can be collapsed for storage when empty,
(b) a three-way valve adapted to be connected in the second conduit so that a first opening of the valve is connected to the pump and a second opening is connected to the outlet through-hull fitting,
(c) a hose connecting a third opening of the valve to the nozzle of the container, the hose being formed with a rigid, upwardly-extending portion attached to the container and a flexible portion attached to the three-way valve, a hose clamp being used to connect the flexible portion to the rigid portion, and
(d) an air vent tube connecting an intermediate portion of the hose to a high point of the system.

4,319,367

BATHROOM SPACE EXPANDER

Humberto Cantillo, 11431 SW. 191st St., Miami, Fla. 33157

Filed Mar. 17, 1980, Ser. No. 130,866
Int. Cl.[3] E03D *17/00, 1/012;* A47K *1/08;* A47B *57/00*
U.S. Cl. 4—353 6 Claims



1. A bathroom space expander for adaption to a conventional toilet tank having a cover, comprising;

a first member defining a generally rectangular surface sized and shaped to fit compatibly with the toilet tank cover, the first member having a main generally rectangular surface with top and bottom surfaces and front, side and rear edges,

a second member swingable in relation to the first member, defining a generally rectangular surface approximately equal to but slightly greater than first member's main surface, the second member having a top and bottom surfaces with a front edge and overhanging side and rear edges defining overhanging side and rear walls,

means for swingably connecting the members to a first closed stored position and a second operational position,

means for supporting the second member in the operational position,

means for securely but removably connecting the first member to the toilet tank cover;

said side edges each comprising an expandable side having a predetermined length and including a pair of inwardly extending elongated longitudinal members having a first portion within the second member main surface and including an upwardly extending top means, and a second exposed portion outside the main surface having a second end fixed connected to the side edge and,

the second member having a pair of longitudinally extending recesses adapted for slidable connection with the side elongated members and the recess having an upper open space sized and adapted for limiting slidable connection with the stop means to allow for limited slidable movement of the expandable side with respect to the second member.

4,319,368

TODDLER-PROOF LATCH FOR TOILET FLUSH LEVER

Judith A. Peters, 4307 Gilbert St., Oakland, Calif. 94611

Filed Dec. 11, 1980, Ser. No. 215,505
Int. Cl.[3] A47K *17/00*
U.S. Cl. 4—661 8 Claims

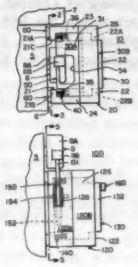
1. A latch for an externally mounted, rotatable toilet flush lever mounted on a wall of a water closet and having a hub and a lever arm extending from said hub, said latch comprising:

a housing adapted to be mounted to said wall of said water closet in a prearranged position in the vicinity of said flush lever;

actuating means carried at least partially within said housing and manually actuable from a latching position to an unlatching position;

spring means for biasing said actuating means towards said latching position; and

latch means carried on one of said housing and said actuator means and operative in response to said actuator means for preventing operation of said flush lever when said actuator means is in said spring biased latching position and



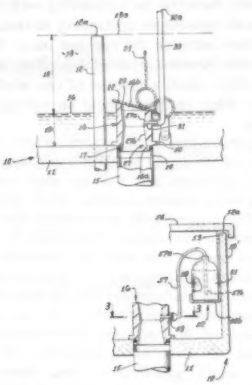
permitting operation of said flush lever when said actuating means is in said manually actuated unlatching position.

4,319,369

TOILET ADDITIVE DISPENSER

Richard L. Lippincott, Sr., 22122 Wood Island La., Huntington Beach, Calif. 92646

Filed Sep. 16, 1980, Ser. No. 187,799
Int. Cl.[3] E03D *9/03, 9/02*
U.S. Cl. 4—228 9 Claims



1. In combination with a toilet flush tank having a bottom wall drain opening, the improvement comprising:

(a) a tubular body adjustably located in drain communication with said opening and having an inlet spaced above the level of said opening so that only tank water above the level of said inlet will flow downward through said body during the toilet flush cycle,

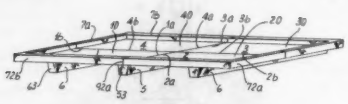
(b) the body containing a venturi to accelerate said flow,

(c) means connected with said body to conduct chemical fluid to said venturi, said means including a container supported by the tank, and

(d) said means to conduct chemical fluid to the venturi includes a tube connected with said ducting and inserted into said container to draw fluid from the container in response to flush water flow downwardly through the venturi.

4,319,370
BASE FOR A BED

James D. Robinson, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 968,434, Dec. 8, 1978, abandoned. This application Oct. 11, 1979, Ser. No. 83,951
Claims priority, application United Kingdom, Oct. 5, 1978, 39410/78
Int. Cl.³ A47C 19/00, 19/20
U.S. Cl. 5—201 8 Claims

1. A base for a bed, the base comprising at least one pair of coupled laterally adjacent thermoplastics platforms having horizontal surfaces for supporting a prostrate human body, and at least one coupling which holds together a pair of laterally adjacent platforms in such a way that an edge of one platform of a pair is opposed to an edge of the other platform of the pair wherein:

(a) the coupling comprises opposed upstanding spaced surfaces restrained from moving apart by at least one interconnection,

(b) each platform of a laterally adjacent pair is provided with:

(i) an outer depending surface which extends downwards and opposes an outer depending surface of the other platform of the pair, and

(ii) an inner depending surface which extends downwards and enters between the upstanding surfaces of the coupling, and opposes an upstanding surface,

whereby reaction between the opposed outer depending surfaces and reaction between an inner depending surface and the upstanding surface resists a rotation of one platform of a pair relative to the other platform about an axis parallel to their opposed edges.

4,319,371
LEAFCUTTER BEE NEST

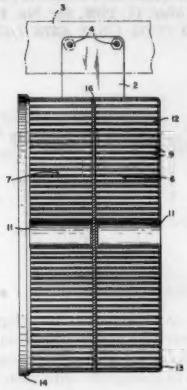
LeRoy J. Wiederrich, North Havre, Mont., assignor to Pollination Technics, Inc., Havre, Mont.

Filed Oct. 9, 1979, Ser. No. 82,739
Int. Cl.³ A01K 47/00
U.S. Cl. 6—1 2 Claims

2. A bee culture nest comprising:

a nesting unit of generally circular cross-section having front and rear faces and a plurality of nesting tunnels extending between said front and rear faces;

barrier means for closing one end of said tunnels and for permitting air passage therethrough while forming a barrier to the penetration of parasites, said barrier means comprising a generally circular disk of porous foamed synthetic polymer material; and

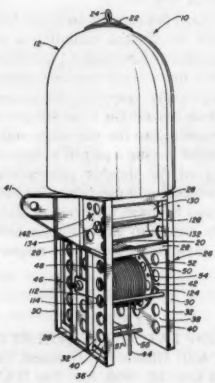


a generally cylindrical housing for enclosing the nesting unit and maintaining the barrier means in contact with the rear face of the nesting unit.

4,319,372
SUBMARINE RESCUE CABLE REEL

Wayne R. Tausig, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 7, 1980, Ser. No. 137,681
Int. Cl.³ B63B 21/52
U.S. Cl. 441—25 19 Claims



1. Apparatus for delivering a cable having a first end fixed to an object at an extended depth to the ocean's surface comprising:

a. a frame assembly;

b. a cable reel rotatably mounted in said frame assembly, said cable reel holding the cable to be delivered to the surface;

c. means for locking said cable reel to prevent said cable reel from rotating;

d. positive buoyancy means attached to said frame assembly;

e. means for releasing said means for locking to allow said cable reel to rotate;

f. means for controlling the speed at which said cable is payed out as the apparatus ascends to the surface comprising a waterbrake coupled for providing torque to the

cable reel, the torque provided by said waterbrake being opposite in direction to the torque provided by said cable; said waterbrake including:

a first paddle having at least one blade and having a drive shaft rotatably mounted in said frame assembly;

a first drive wheel mounted on said drive shaft of said first paddle;

a second drive wheel coupled to said cable reel for rotation therewith;

a drive means positively coupling said first and second drive wheels so that rotation of the cable reel produces a rotation of the first paddle, the resistance of the water to the rotation of the first paddle providing the torque opposite in direction of the torque on the cable reel due to the cable;

said at least one blade being curved so that the convex surface of said blade pushes against the water when the cable reel rotates as the cable pays out;

a second paddle having at least one blade and having a drive shaft rotatably mounted in said frame assembly;

a V-belt pulley mounted on the drive shaft of said first paddle;

a split pulley of the V-belt type having a movable half which is free to move along the axis of and interposed in the drive shaft of said second paddle;

a V-belt passing over said V-belt pulley and said split pulley; and

depth-activated means for controlling the position of the movable half of said split pulley to change the tension in said V-belt to couple or uncouple the drive shaft of the second paddle from the drive shaft of the first paddle.

4,319,373

SHOE LASTING MACHINE

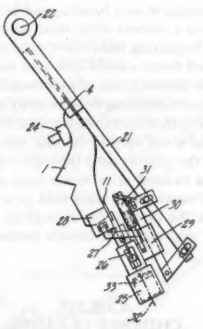
Gerhard Lauckhardt, Ffm-Rodelheim; Rudi Fichtner, Rosbach, and Manfred Bröning, Ffm-Sossenheim, all of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

Filed Apr. 28, 1980, Ser. No. 144,331

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1979, 2917552

Int. Cl.³ A43D *21/00*

U.S. Cl. 12—8.3 **4 Claims**



1. Machine for lasting shoes comprising means for supporting a last carrying a shoe comprising an upper and an insole, side lasting instrumentalities, comprising two lasting rolls arranged one at each side of the last supporting means, means for effecting relative movement, heightwise of the shoe, between the side lasting instrumentalities and the last supporting means, to bring the lasting rolls into and out of an operative condition, in engagement with the bottom of a shoe supported by the last supporting means, means for effecting relative movement, lengthwise of the shoe, between the last supporting means and the side lasting instrumentalities whereby to cause the lasting rolls, in operative condition, progressively to last opposite side portions of the shoe simultaneously, starting at the ball region and terminating at the heel breast line region thereof, heel seat lasting instrumentalities, comprising a wiper plate assembly, for lasting the heel seat region of the shoe, and adhesive applying means, in the form of two nozzles, one associated with each lasting roll, and each being arranged to apply adhesive progressively, along a side portion of the shoe, between lasting marginal portions of the shoe upper and corresponding marginal portions of the insole, in advance of its associated lasting roll, as relative movement is effected as aforesaid between the lasting rolls and the last supporting means, wherein, when, in the operation of the machine, the relative movement between the last supporting means and the side lasting instrumentalities is arrested with said instrumentalities in the heel breast line region, the lasting rolls remain in operative condition, pressure thus continuing to be applied thereby to the shoe bottom, while the nozzles are caused to continue progressive application of adhesive in the heel seat region, whereafter the side lasting instrumentalities and the nozzles therewith are moved out of operative condition and the heel seat lasting instrumentalities are actuated, the arrangement being such that the heel seat lasting instrumentalities overlap the area previously lasted by the side lasting instrumentalities.

4,319,374

METHOD OF CONSTRUCTING A STAYED GIRDER BRIDGE

Herbert Schambeck, Herrsching, Fed. Rep. of Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 964,580, Nov. 29, 1978, abandoned. This application Aug. 19, 1980, Ser. No. 179,513

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1977, 2754213

Int. Cl.³ E01D *1/00*

U.S. Cl. 14—1 **4 Claims**

1. Method of constructing a stayed girder bridge, the stayed girder bridge including a first end abutment and a second end abutment spaced from the first end abutment, a plurality of spaced permanent bridge supports located between and spaced from the first and second end abutments, a stiffening girder formed of one of reinforced concrete or prestressed concrete and extending between the first and second end abutments over the bridge supports, a tower extending upwardly from the stiffening girder and located intermediate the first and second end abutments, and at least two stays each extending in an opposite direction from the upper part of the tower diagonally downward to the stiffening girder with the stays anchored both to the tower and the stiffening girder, wherein the method comprises the steps of constructing the first and second end abutments and the permanent bridge supports spaced between the abutments, constructing in series individual sections of the stiffening girder in formwork located adjacent the first end abutment, interconnecting adjacent individual sections of the stiffening girder by means of the reinforcement in the sections, moving the sectionally constructed stiffening girder in a stepwise manner out of the formwork and from the first end abutment toward the second end abutment with the movement of the girder during each step being equal to the length of the section formed, supporting the girder during movement on the permanent bridge supports and providing temporary support for the girder intermediate the permanent bridge supports, after completing the movement of the stiffening girder to the second end abutment, constructing a tower of reinforced concrete upwardly from the stiffening girder at a location spaced from the first and second end abutments and aligned above one of said permanent supports, constructing a

pair of stays of prestressed concrete each connected to the tower at the upper part thereof and each extending diagonally downwardly therefrom in an opposite direction and in the length direction of said girder and connected to the stiffening girder at the lower ends thereof at spaced locations from the tower, and maintaining the temporary supports under the girder at least for the length thereof covered by the stays extending from the tower until the tower and stays are completed, and then removing the temporary supports under the length of the girder covered by the stays.

4,319,375

DEVICE FOR FOLDING THE SPANS OF A BRIDGE FOR TRANSPORT ON A VEHICLE

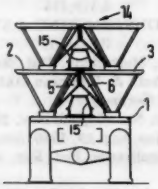
Jürgen Mahncke, Korntal, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 26, 1979, Ser. No. 97,123

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1978, 2850849

Int. Cl.³ E01D *15/12*

U.S. Cl. 14—2.4 **6 Claims**



4. A transportable bridge unit comprising bridge spans located side-by-side and held apart by crosspieces, with a space between said spans, for transport aboard a vehicle, characterized by the fact that the crosspieces comprise rigid spars each of which is connected to one of said bridge spans and to a central transverse web, which extends transversely between the spars at a central portion of the bridge, by pivotal connecting means for rigidly interconnecting said bridge spans, said pivotal connecting means being at least partially disconnectable for enabling the spans to change their positions relative to each other between an in-use configuration capable of being traveled upon and a non-functional compacted vehicle transportable configuration.

4,319,376

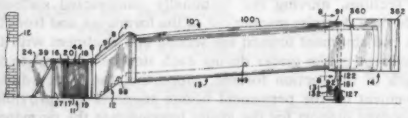
PASSENGER LOADING BRIDGE

Robert L. Saunders, Ogden, Utah, assignor to Abex Corporation, New York, N.Y.

Division of Ser. No. 912,692, Jun. 5, 1978, Pat. No. 4,161,049, which is a continuation of Ser. No. 847,638, Nov. 1, 1977, abandoned. This application Mar. 23, 1979, Ser. No. 23,414

Int. Cl.³ E01D *15/00*

U.S. Cl. 14—71.5 **7 Claims**



1. A passenger loading bridge for interconnecting an aircraft with the ground level of an airport terminal building including:

a. a rotunda connected to the building substantially at ground level;

b. a tunnel support vertically pivotally connected at its inner end to the rotunda;

c. a tunnel having first horizontal pivot means connecting its inner end to the tunnel support outer end;

d. an aircraft engaging cab assembly connected to the outer end of the tunnel; and

e. a drive assembly having second horizontal pivot means mounting the outer end of the tunnel and including elevating means for elevating the tunnel and cab assembly; characterized by

f. a staircase located in the tunnel support;

g. the first horizontal pivot means connecting the tunnel to the tunnel support being located at the top of the staircase;

h. a cab support rigidly mounting the cab assembly to the drive assembly, and

i. leveling means mounted on the drive assembly to maintain the cab assembly substantially parallel to the ground at all cab elevations.

4,319,377

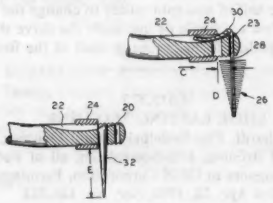
INTERPROXIMAL TOOTHBRUSH

Emanuel B. Tarrson, and Dane Maric, both of Chicago, Ill., assignors to John O. Butler Company, Chicago, Ill.

Filed Aug. 25, 1980, Ser. No. 180,812

Int. Cl.³ A46B *3/08, 3/18, 9/04*

U.S. Cl. 15—111 **7 Claims**



1. An interproximal brush handle comprising an elongated handle part having a bend near one end, said handle terminating in a threaded portion at the bent end, at least one hole lying in the plane of said bend and extending diametrically through said threaded portion of said handle, said hole having a diameter which receives a twisted wire brush stem, a groove having a lower surface beginning near the top of said hole at a point which is displaced downwardly into said handle by a distance which is less than the thickness of said twisted wire brush stem, said groove further extending downwardly along the length of said handle to a depth which is more than the thickness of said twisted wire, and a nut turned on said threaded portion, the lower surface of the groove near the top of the hole being high enough so that a twisted wire brush stem extending through said hole and pressed down into said groove forms a hump projecting above the threads far enough to terminate the forward motion of said nut as it travels toward the end of said handle.

4,319,378

CHIMNEY CLEANER

Samuel J. Bowman, and William F. Bowman, both of 307 Berks St., Pottstown, Pa. 19464

Filed Jul. 7, 1980, Ser. No. 166,199

Int. Cl.³ F23J *3/02*

U.S. Cl. 15—162 **8 Claims**

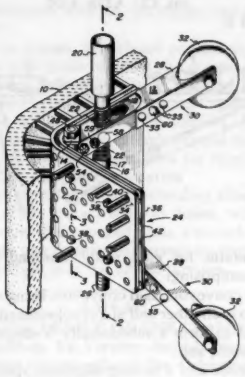
1. A chimney cleaner intended to receive a brush removably attached thereto comprising:

(a) a pair of legs spaced and pivotally held apart at their one end by an elongated brush retaining bracket and at their other end each adapted to receive a wheel;

(b) a rod parallel to said bracket passing through each of said legs;

(c) pivotal journal bearings within each of said rod-to-leg

intersections to receive said rod, said rod, two legs and bracket forming an A-frame, said bracket-to-leg and rod-to-leg pivot points thereby allowing a parallel longitudinal reciprocation of the brush retaining bracket to be produced when a longitudinal reciprocation by a manual upward and downward thrust is applied to said rod within a chimney; and,



(d) threads located on said rod segment which passes through one of said journal bearings and also mating threads within said corresponding leg's journal bearing whereby a torque applied to said rod changes the width between said legs and therefore said chimney cleaner's overall diameter so that a brush mounted on said brush retaining bracket may be tensioned against the chimney wall to be cleaned.

4,319,379

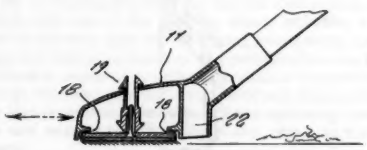
PICKUP

William J. Carrigan, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Apr. 29, 1980, Ser. No. 144,968

Int. Cl.³ A47L 9/06

U.S. Cl. 15—400 **3 Claims**



1. A pickup pad accessory for a vacuum cleaner attachment comprising in combination a sheet having plush-like slanted filaments on one side, said sheet being attached at its rear on a stiff backing plate, and means on a rear of said plate for securement to different sizes of mounting holes on said attachment, said means also preventing mounting of the pad with filaments in an incorrect orientation.

4,319,380

TELESCOPABLE GUIDING DEVICE FOR HOUSEHOLD APPARATUS

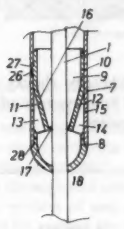
Hans-Peter Simm, Wuppertal; Wieland Gühne, Remscheid-Hasten, and Annegret Schlecht, Wuppertal, all of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed May 19, 1980, Ser. No. 151,102

Claims priority, application Fed. Rep. of Germany, May 29, 1979, 7915432

Int. Cl.³ A47L 9/28, 9/32

U.S. Cl. 15—410 **12 Claims**



1. A guiding device for a household apparatus having a housing, particularly for a vacuum cleaner, the guiding device comprising a telescopable guiding element including a first tubular member arranged to be fixedly connected with a housing of a household apparatus, and a second tubular member which is telescopable relative to said first tubular member and has a handle with a switch, said second tubular member having a proximal end portion and a distal end portion relative to said first tubular member; an electric conductor arranged to extend inside said telescopable guiding element from the housing of the household apparatus to said switch, said electric conductor extending first helically through said first fixedly connected tubular member and then rectilinearly through said telescopable tubular member and is clamped in the latter in the region of said proximal end portion; and means for clamping said electric conductor in said second telescopable tubular member in the region of said proximal end portion, said clamping means including an insert element insertable into said second telescopable tubular member, said inert element having a hollow body and two oppositely located elastic tongues each having an outer edge which extends outwardly beyond the periphery of said body prior to the insertion of said insert element into said second telescopable tubular member, said electric conductor extending inwardly of said insert element.

4,319,381

SHOCK ABSORBING CASTOR

Keith S. Rodaway, Santa Monica, Calif., assignor to Everest & Jennings, Inc., Los Angeles, Calif.

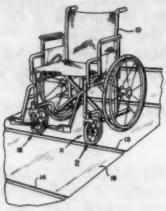
Filed Jul. 14, 1980, Ser. No. 167,822

Int. Cl.³ A47B 91/00

U.S. Cl. 16—44 **4 Claims**

1. A shock absorbing castor for a wheelchair including:
(a) a castor wheel;
(b) a fork frame rotatably mounting the wheel;
(c) a vertical swivel shaft for coupling to the wheelchair at its upper end, said shaft terminating at its lower end in a cross member pivoting said fork frame for swinging movement relative to said shaft about an axis above and forward of and parallel to the axis of rotation of said wheel; and;
(d) leaf springs secured at upper ends to said cross member and extending down inside said fork frame on either side of the castor wheel, said fork frame having inwardly directed projections against which the lower ends of the leaf springs bear to thereby bias said fork frame in a direc-

tion to move the axis of said wheel into closer vertical alignment with the axis of said swivel shaft to thereby effectively increase the distance between the castor wheel



and wheelchair, whereby shocks experienced by said wheel are absorbed by movement of the wheel against the bias of the spring means.

4,319,382

CABINET FURNITURE WITH HINGED FRONT DOOR CONTAINING BUILT-IN APPLIANCE

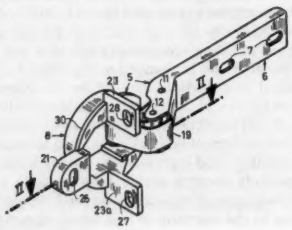
Ernst Zernig, Hemer, Fed. Rep. of Germany, assignor to Richard Heinze GmbH & Co. KG, Herford, Fed. Rep. of Germany

Filed Jul. 6, 1979, Ser. No. 55,256

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1978, 2831355

Int. Cl.³ E05D *3/06, 3/08, 3/10, 15/52*

U.S. Cl. 16—251 **8 Claims**



1. In a furniture arrangement of the type comprising a cabinet having an appliance such as a refrigerator installed within the interior of the cabinet, the cabinet having an outer door and the appliance having a separate outer door located behind the cabinet door, the cabinet and appliance doors being interconnected to one another to provide a composite door which may be opened as a unit to simultaneously open the cabinet and appliance, the improvement comprising a hinge having an elongated hinge arm which is secured to a side wall of said appliance at a location within said cabinet, said hinge arm extending forwardly from said appliance side wall toward the doors of said cabinet and appliance, a mounting plug pivotally connected to the forward end of said elongated hinge arm, said mounting plug being embedded within a recess located in the rear interior side of said cabinet door, and said mounting plug having at least one flange extending outwardly of said plug in substantially perpendicular relation to the plane of said cabinet door, said flange being attached to a side edge of said appliance door, whereby said hinge interconnects said cabinet and appliance doors to one another and hingedly connects the interconnected doors as a unit only to the side wall of said installed appliance.

4,319,383

APPARATUS FOR ELECTRICALLY STUNNING ANIMALS TO BE SLAUGHTERED

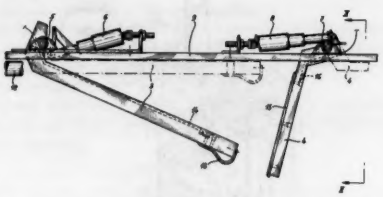
Johan W. Nijhuis, Winterswijk, Netherlands, assignor to Machinefabriek G. J. Nijhuis B.V., Netherlands

Filed May 8, 1980, Ser. No. 148,034

Claims priority, application Netherlands, May 10, 1979, 7903680

Int. Cl.³ A22B *3/06*

U.S. Cl. 17—1 E **2 Claims**



1. An apparatus for electrically stunning animals to be slaughtered, comprising:

two endless conveyors, said conveyors being operable to run parallel to each other and at a synchronized rate and being positioned to form a substantially V-shaped passageway therebetween; and,

a first electrode and a second electrode spaced apart from said first electrode, said electrodes being adapted to contact the head of an animal, said electrodes being adapted to extend downwardly toward said V-shaped passageway, said electrodes being adapted to be pushed in the direction of movement out of their initial position, said electrodes being biased toward their initial position by spring pressure, said electrodes being rotatable about horizontal shafts arranged above said conveyors, the first electrode being directed slopingly downward to the front in the direction of movement, said first electrode having an electrode contact surface at its lower end, the second electrode being directed slopingly downward and backward, said second electrode having an electrode contact surface over substantially the entire side thereof facing said first electrode.

4,319,384

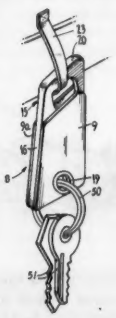
KEY RETAINER CLIP

Richard J. Horne, 6/26 Devon St., Cheltenham, Victoria, Australia 3192

Filed May 27, 1980, Ser. No. 153,418

Int. Cl.³ A45F *5/02;* **A47G** *29/10*

U.S. Cl. 24—3 R **7 Claims**



1. A key retainer clip for connecting a key ring to a belt loop or belt, which clip comprises in combination:

(a) a body defined by a pair of spaced walls;

(b) a trigger;

(c) means for pivotally connecting the trigger between the walls at a point adjacent a first end of the body with an extremity of the trigger extending outwardly from a second end of the body;

(d) means at the pivot connection point of the trigger for securing a key ring to the body;

(e) stop means carried by the body for engagement by the trigger;

(f) a spring disposed between the trigger and a first side of the body for:

i. biasing the trigger in a closed position in engagement with the stop means wherein the trigger and body define a closed area; and

ii. permitting the trigger to be pivoted against the bias of the spring into an open position wherein a portion of the extremity of the trigger extends beyond the first side of the body to define an open area for receiving the belt loop or belt therein; and wherein

(g) the trigger includes an arm extending along and across the width of the spaced walls to define, with the corresponding edges of the spaced walls, a second side opposite the first side and having a substantially coplanar surface when the trigger is in the closed position.

4,319,385

FASTENING DEVICE OF THE CLAMP TYPE

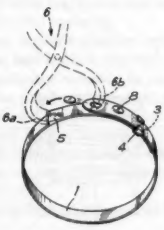
Jacques R. Marchou, La Varenne Saint-Hilaire, France, assignor to Societe en nom collectif dite: Calmettes, Marchou & Cie, Malmaison, France

Filed Jun. 4, 1979, Ser. No. 44,947

Claims priority, application France, Jun. 6, 1978, 78 16913

Int. Cl.³ B65D *63/02*

U.S. Cl. 24—20 R **5 Claims**



1. A fastening device of the clamp type, comprising a strap adapted to be wound about an object, said strap including opposed ends with a respective end portion at each end having complimentary anchoring means for maintaining said strap in a wound configuration about said object, each end portion further having gripping means adapted to be engaged by a tightening tool to tighten said strap about said object and to bring the anchoring means of one end portion into engaging relation with the anchoring means of the opposed end portion of the opposed end, one of the gripping means including a relief formed in the strap with the relief being joined along a peripheral portion thereof to the strap, said peripheral portion having a mechanical resistance to being torn which is less than that of the strap, wherein said relief is torn off of said strap by the tool along said peripheral portion during the tightening operation when said strap is tightened about said object to a desired tightness.

4,319,386

BUCKLE WITH RIGID PLATE AND SLEEVE

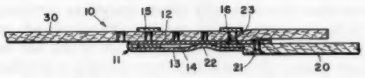
Roger D. Shoemaker, 2861 Lakeshore Dr., Manistee, Mich. 49660

Filed Jul. 9, 1979, Ser. No. 55,985

Int. Cl.³ A44B *11/00*

U.S. Cl. 24—164 **14 Claims**

1. A buckle comprising: an elongated rigid plate, said plate having a base leg and a return leg, said return leg being the free end of said plate doubled back upon itself and closely paralleling said base leg to form a blind channel between said legs; a pair of rigid ring elements of rectangular cross section; one of said ring elements having one side seated in said channel adjacent said blind end, said other ring element having one side seated in said channel and being elongated to form a tubular sleeve of rectangular cross section; a stud projecting outwardly from one of said legs and being of a length substantially equal to the spacing from said plate to the other side of said



other ring element; said other ring element being of a size to slidably receive and seat closely about a flexible strap extending therethrough and seated against said plate, said other ring element being slidable along said plate from adjacent said one ring element to a position substantially centered over said stud to trap a strap passing through said other ring element, means for securing said base portion of said plate to a strap, and a retaining closing means for closing the end of said channel and forming a stop limiting movement of said other ring element, said stop providing a seat for said other ring element when it is aligned with said stud.

4,319,387

SLIDE FASTENER STRINGER

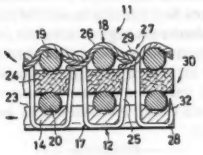
Hiroshi Yoshida, Kurobe, Japan, assignor to Yoshida Kogyo, K.K., Tokyo, Japan

Filed Dec. 19, 1979, Ser. No. 105,252

Claims priority, application Japan, Dec. 21, 1978, 53-160693; Dec. 21, 1978, 53-160694

Int. Cl.³ A44B *19/00*

U.S. Cl. 24—205.16 R **5 Claims**



1. A slide fastener stringer comprising:

(a) a stringer tape having a pair of opposite surfaces;

(b) a series of fastener elements disposed on one of said surfaces of said stringer tape along one longitudinal edge therefore; and

(c) sewing stitches securing said fastener elements to said stringer tape, said sewing stitches being composed of a needle thread and a looper thread, said needle thread having loops each passing through said tape from the other surface thereof and extending in between adjacent two of said fastener elements, said looper thread having loops extending across and over said fastener elements on said one surface of said tape, said needle thread being interlaced and interlooped with said loops of said looper thread;

(d) said needle thread including a monofilament yarn having a coefficient of thermal contraction, said looper thread including a non-monofilament yarn;

(e) said needle thread, after sewn to said tape, being heat-set to shrink it and render it dimensionally stable.

4,319,388

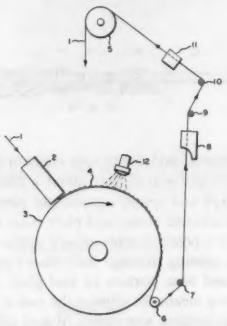
TREATMENT FOR BULKED CONTINUOUS FILAMENT YARNS

Ashok J. Champaneria, Seaford, Del., and Mohinder K. Gupta, Salisbury, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 11, 1980, Ser. No. 158,611

Int. Cl.[3] D02G *1/20*

U.S. Cl. 28—257 2 Claims



1. An improvement in a process for bulking carpet yarns of at least 1000 denier of plasticizable filaments with compressible fluid heated to a temperature which will plasticize the filaments and jetted as a high velocity stream from an orifice, wherein the plasticizable filaments are continuously forwarded by the heated fluid while in a plasticized condition and then impinged in the jetted stream on a moving screen to remove the filaments from the heated fluid for cooling, and while on the moving screen the filaments are conveyed through a cooling water mist spray to set crimp in the filaments, and the cooled filaments are finally taken up from the moving screen around a guide at a uniform position in the screen travel and the yarn is wound under tension into a package, wherein the improvement comprises, after said yarn has been removed from the moving screen and before it is wound into said package, passing the yarn first under a tension of from about 0.01 to about 0.05 grams/denier through a turbulent dual impingement forwarding jet stream of steam and then through a cooling jet stream of ambient air which impinges approximately perpendicularly upon the yarn at a greater tension of about 0.02 to 0.15 gpd to facilitate crimp redevelopment and uniformity of bulk along the yarn.

4,319,389

CONTROLLED DEFLECTION ROLL

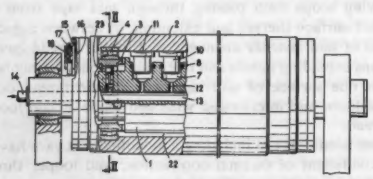
Ignazio Marchioro, I-Schio, Italy, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Oct. 22, 1979, Ser. No. 87,091

Claims priority, application Switzerland, Nov. 8, 1978, 11469/78

Int. Cl.[3] B21B *13/02*

U.S. Cl. 29—116 AD 9 Claims



1. A controlled deflection roll comprising:

a stationary roll support;

a roll shell rotatable about said stationary roll support;

means for mounting said roll shell for rotation about said stationary roll support and for movement relative to said stationary roll support in order to carry out displacement motions;

at least one pressure element for forming a pressure force effective at the roll shell;

said pressure element being arranged between the roll shell and the stationary roll support;

control means arranged between the roll shell and the stationary roll support;

said control means being influenced by the displacement movement of the roll shell and upon exceeding a permissible maximum value of the displacement movement effecting the pressure force exerted by the pressure element at the roll shell such that such pressure force is limited to a degree which does not endanger the roll shell.

4,319,390

SAG PREVENTION MEANS FOR A ROLLER FOR THE PRESSURE TREATMENT OF WEBS OF MATERIAL

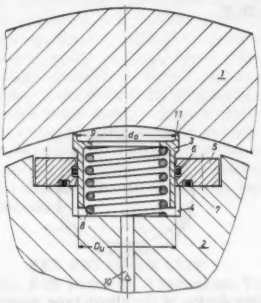
Robert Wolf, Herbrechtingen, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Feb. 20, 1980, Ser. No. 123,014

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1979, 2907761

Int. Cl.[3] B21B *13/02*

U.S. Cl. 29—116 AD 10 Claims



1. A roller for pressure treatment of webs of material, or the like, comprising:

an annular roller shell; a support extending through the shell; the support and the shell being respectively sized so as to have a space defined between them, which enables the support to shift and sag radially with respect to the shell upon pressure being applied to the shell;

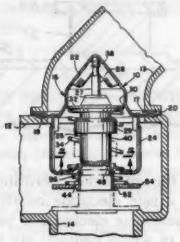
at least one support means for transmitting pressing forces from the shell to the support; the support means comprising an opening defined in and extending into the support from the surface thereof for defining an open space for holding a pressurized liquid, the opening extending substantially in the direction of support of the roller shell against pressure applied to the roller shell;

the support means further comprising a sleeve positioned in the opening and the sleeve extending out to and having an end thereof that opens to the shell; the sleeve being shiftable into and out of the opening, to have the end thereof generally at the shell as the support shifts and sags; the sleeve being open inside along its entire length, whereby the sleeve does not throttle liquid flow along its length and the entire opening may be filled with liquid at uniform pressure; the opening being adapted for connection to a source of pressurized liquid; the sleeve being sealed closed across the space between the shell and the support.

4,319,391
METHOD OF CONSTRUCTING THERMOSTATIC VALVE POWER ELEMENT EXTENSION

Mark E. Beck, Villa Park, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 927,254, Jul. 24, 1978, Pat. No. 4,269,350.
This application Jul. 18, 1980, Ser. No. 170,307
Int. Cl.³ B21D *53/00;* B21K *29/00;* B23P *15/26*
U.S. Cl. 29—157.1 R 3 Claims



1. A method of attaching a tubular extension member to the bottom end of a temperature responsive power element for use in thermostatic fluid valves, said power element having a cup-shaped hollow body member filled with solid material changeable to a liquid at a predetermined temperature level, which comprises:

(a) cold heading said hollow body member from a blank of material to include a raised boss extending outward axially from the lower end thereof;

(b) filling said hollow body member with a predetermined volume of said solid material;

(c) positioning an actuator member over said solid material as contained in said hollow member;

(d) sealing said actuator member to said hollow member;

(e) calibrating the axial expansion of said solid material at said predetermined temperature level by indentation of the walls of said hollow member;

(f) providing an elongated tubular member with one end thereof having an inwardly extending flange about the periphery thereof;

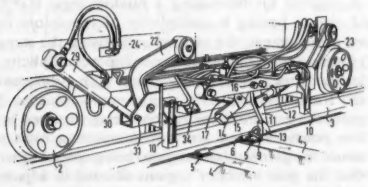
(g) positioning said flanged end of said tubular member over said boss; and

(h) deforming by orbital staking a portion of said boss radially outwardly over said inwardly extending flange of said tubular member.

4,319,392
REMOVING RAIL CLIPS FROM A RAILWAY TRACK

Glynn D. Cutts, Sheffield, England, assignor to Pandrol Limited, London, England

Filed Jul. 10, 1979, Ser. No. 56,434
Claims priority, application United Kingdom, Jul. 18, 1978, 30271/78
Int. Cl.³ B23P *6/00, 19/02, 19/04*
U.S. Cl. 29—402.08 10 Claims



1. A device suitable for use in removing rail clips from rail-securing positions in a railway track of the type comprising two rails each having, at intervals along it, two upwardly-extending projections on opposite sides of the rail for locating the rail, at least one of each two projections having driven into it a first portion of a rail clip, which first portion is substantially parallel to the rail, the clip having a second portion bearing downwardly on the top of a flange of the rail, a third portion bearing downwardly on an unyielding surface which is on that side of the first portion of the clip remote from the rail, a fourth portion interconnecting said first portion with one of said second and third portions, and a fifth portion interconnecting said second and third portions, at least one of said fourth and fifth portions extending above said upwardly-extending projection, the device comprising a trolley constructed to run on at least one rail of the track and carrying a member which is adjustable to a position such that when the trolley runs along the track in an appropriate direction the member strikes one of said fourth and fifth portions of all the clips on one side of one of the rails and forces their first portions out of the projections, the member being fixed, or having means for fixing it, so that it does not move relative to the trolley when it strikes one of the clips.

9. A method of removing rail clips from rail-securing positions in a railway track of the type comprising two rails each having, at intervals along it, two upwardly-extending projections on opposite sides of the rail for locating the rail, at least one of each two projections having driven into it a first portion of a rail clip, which first portion is substantially parallel to the rail, the clip having a second portion bearing downwardly on the top of a flange of the rail, a third portion bearing downwardly on an unyielding surface which is on that side of the first portion of the clip remote from the rail, a fourth portion interconnecting said first portion with one of said second and third portions, and a fifth portion interconnecting said second and third portions, at least one of said fourth and fifth portions extending above said upwardly-extending projection, said method comprising:

operating a trolley to run along the track, adjusting an adjustable member which is carried by the trolley to a position such that as the trolley moves along the track the member strikes one of said fourth and fifth portions of all the clips on one side of one of the rails and forces their first portions out of the projections so as to remove the clips, and fixing the member against movement out of said position so that it does not move relative to the trolley when it strikes one of the clips.

4,319,393
METHODS OF FORMING SWAGES FOR JOINING TWO SMALL TUBES

Ivo C. Pogonowski, Blacksburg, Va., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 878,625, Feb. 17, 1978, Pat. No. 4,220,034.
This application Mar. 10, 1980, Ser. No. 128,751
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—434 6 Claims

1. (FIGS. 1 and 2) A method for forming a swage for joining together two small telescopic tubes comprising,

(a) mounting a piston having an axis in one end of a cylinder for operation therein,

(b) pivotally connecting one end of a first arm to the piston on one side of the piston axis,

(c) pivotally connecting one end of a second arm to the piston on the other side of the piston axis,

(d) fixing first indentation tip means to the other end of the first arm on the other side of the piston axis, (e) fixing second indentation tip means to the other end of the second arm on the one side of the piston axis, and

(f) forming biasing means for pivoting said other ends of the respective arms outwardly transversely of the cylinder

responsive to movement of the piston toward the arms for deforming two contiguous dimples in the two small tele-

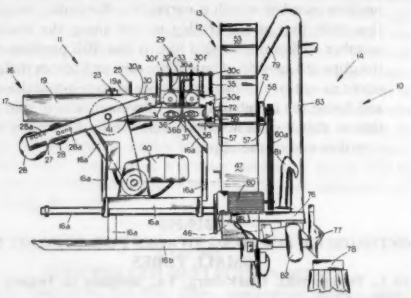
scopic tubes for thus forming a swage for efficiently joining together two small tubes.

4,319,394

METAL RECOVERY APPARATUS

George M. Vercruysse, Jr., 1516 Military, Omaha, Nebr. 68101

Filed Dec. 12, 1979, Ser. No. 102,605
Int. Cl.[3] B23P *23/00*; B02C *19/12*; B07B *7/01*
U.S. Cl. 29—564.4 15 Claims



1. A process for recovering metal from insulated wire comprising the steps of:

linearly moving uncut lengths of said wire along its axis;

flattening said uncut lengths of said wire;

forming multiple impressions on said uncut lengths of said wire substantially normal to its axis;

cutting said flattened and impressed uncut lengths of said wire into pieces;

beating said pieces into primarily metal and insulation components within a housing;

screening through a perforated floor in the housing the primarily metal components onto a sloping tray;

vibrating the sloping tray;

moving the primarily metal components down the sloping tray through a chute into a receiving tray; and

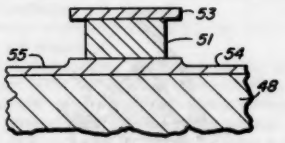
vacuuming the insulation components from the housing, the sloping tray and the chute.

4,319,395

METHOD OF MAKING SELF-ALIGNED DEVICE

Clarence A. Lund; Edward W. Barron, both of Mesa; Howard E. Holstin, Tempe, and Michael D. Sugino, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 28, 1979, Ser. No. 53,132
Int. Cl.[3] H01L *21/306, 21/441*
U.S. Cl. 29—571 9 Claims



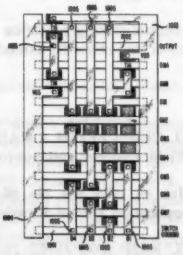
1. In a process for the self-aligned fabrication of semiconductor devices having a gate electrode overlying an insulating layer and wherein said gate electrode is patterned to define areas in a substrate in which contacts are to be formed, the improvement comprising the following steps in the order given: thinning said insulating layer overlying said areas as defined by said gate using said gate as a mask; reducing the width of said gate between said areas to expose full thickness portions of said insulating layer; doping said substrate using said reduced width gate as a mask to form source and drain regions self-aligned with said reduced width gate; and removing the thinned portion of said insulating layer to form contact regions to said source and drain regions, said contact regions self-aligned with and spaced from said reduced width gate.

4,319,396

METHOD FOR FABRICATING IGFET INTEGRATED CIRCUITS

Hung-Fai S. Law, Summit, and Alexander D. Lopez, Warren, both of, NJ, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 28, 1979, Ser. No. 108,289
Int. Cl.[3] H01L *21/74, 21/88*
U.S. Cl. 29—571 4 Claims



1. A method for fabricating a random-logic IGFET integrated circuit having a multiplicity of transistors in a prescribed arrangement, the method comprising the steps of:

(1) forming on a single substrate chip a multiplicity of gate insulator regions, each associated with a different one of the transistors and overlying a semiconductive bulk region, the gate insulator regions being disposed in respective positions in an array of intersecting rows and columns, the gate insulator regions being spaced apart, except that the gate insulator regions situated in adjacent rows within a column being adjoined to form merged gate insulator regions;

(2) forming on the chip a plurality of spaced apart gate

conductor paths, each positioned to lie along a respective one of the rows and to overlie the gate insulator regions in the respective one of the rows and serving as the gate electrode where crossing a gate insulator region;

(3) forming source/drain regions in portions of the semiconductive bulk region underlying portions of the gate insulator regions not covered by a gate conductor path;

(4) forming contact means to the source/drain regions; and

(5) forming above the semiconductive bulk region a plurality of second conductor paths for interconnecting the contact means and extending generally orthogonally to the gate conductor paths.

4,319,397

METHOD OF PRODUCING SEMICONDUCTOR DISPLACEMENT TRANSDUCER

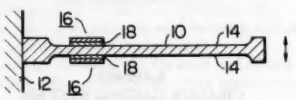
Masanori Tanabe; Satoshi Shimada, both of Hitachi; Akio Yasukawa, Ibaraki; Hideyuki Nemoto; Motohisa Nishihara, both of Katsuta; Masatoshi Tsuchiya, and Ko Soeno, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 7, 1980, Ser. No. 165,985

Claims priority, application Japan, Jul. 10, 1979, 54-87234

Int. Cl.[3] H01L *21/58*

U.S. Cl. 29—589 **17 Claims**



1. A method of producing a semiconductor displacement transducer, comprising:

forming a strain gauge on one surface of a semiconductor single crystal substrate;

forming an insulating oxide film on the other surface of said substrate;

forming a first metal layer on said insulating oxide film;

forming a second metal layer on said first metal layer;

forming a eutectic alloy layer on said second metal layer; and

mounting said substrate thus treated onto a metal strain generator and joining them together by heating this assembly to a temperature approximating the eutectic point of said eutectic alloy to form a compound of said first metal layer and said eutectic alloy layer.

4,319,398

METHOD OF ASSEMBLING ROTOR OF STEPPING MOTOR

Koji Fukuzawa, and Hideo Kawaguchi, both of Kashiwa, Japan, assignors to Oriental Motor Co., Ltd., Tokyo, Japan

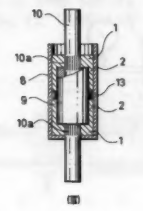
Filed Dec. 7, 1978, Ser. No. 967,403

Claims priority, application Japan, Dec. 13, 1977, 52/149622; Feb. 7, 1978, 53/12574

Int. Cl.[3] H02K *15/02*

U.S. Cl. 29—598 **4 Claims**

1. In a method of assembling the rotor of a stepping motor by stacking up predetermined numbers of first and second ring-shaped core pieces to form cup-shaped core members, said first core pieces having an inside diameter substantially equal to the diameter of the rotor shaft and formed with a number of teeth on the periphery, said second pieces having an inside diameter substantially equal to the outside diameter of a cylindrical magnet to be mounted on said shaft and also having a peripheral contour similar to that of said first core pieces, and then fitting said cup-shaped core members over the both end portions of said magnet, the improvement which comprises the steps of providing a jig of a bottomed cylindrical contour having ribs longitudinally formed on the inner peripheral wall for guiding the teeth on the peripheries of said ring-shaped core pieces and also having a hole formed in the bottom center for insertion of said rotor shaft, stacking up predetermined numbers of said first and second ring-shaped core pieces, in succession, on the inner bottom of said jig, fitting one end portion of said cylindrical magnet into the hollow of a cup-like stack of the both core piece groups, and fitting a ring of elastic material over said magnet, fitting and stacking up a predetermined number of said second core pieces on the opposite end portion of said magnet and then stacking thereon a predetermined number of said first core pieces, forcing a rotor shaft through said stacked groups of core pieces and said cylindrical magnet, thereby integrally assembling said shaft, core piece groups, and magnet all together, and thereafter taking out the assembly from said jig and applying a bonding agent thereon.



4,319,399

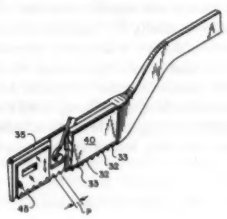
STRAIGHT EDGE RAZOR

John T. Ciaffone, Bridgeport, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 2, 1981, Ser. No. 230,832

Int. Cl.[3] B26B *21/02*

U.S. Cl. 30—32 **1 Claim**

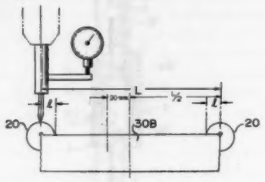


1. A barber razor consisting essentially of a plastic handle terminating in a first blade guide, a second plastic blade guide, a blade having a cutting edge sandwiched movably between said guides, a plastic operating lever supported by said first guide and making a driving connection with said blade for moving the blade relative to the guides from a first position defining a closed position to a second position defining an operating position, said first blade guide being formed with a track for controlling motion of the blade, both said guides being serrated along edges adjacent the cutting edge of said blade, the serrations of one blade being offset relative to the serrations of the other, and said first blade guide being formed with bosses received in clearance holes in said blade, said bosses facilitating securing the blade guides together by sonic welding.

4,319,400
CENTERING DEVICE

Hun-Hwei Chung, 2-16, Lane 81, Chung Shen Rd., Fon Yuan City, Taiwan

Filed Jan. 9, 1980, Ser. No. 110,609
Int. Cl.³ G01B 5/25
U.S. Cl. 33—169 C 2 Claims



1. A centering device comprising:

a centering pointer comprising a cylindrical hollow holder having two ends and within which a needle member having a lower point is slidably coaxially held, and extends out of the first end of said holder, said needle member being resiliently urged by a spring means to extend out of said holder, said spring being disposed within the space defined by the hollow holder, a plug located at the other end of said holder and the needle member, a lever mounted onto said needle member and extending outwardly through a slot formed on said hollow holder, a measuring device for sensing the displacement of said lever, said hollow holder adapted to be coaxially detachably mounted onto the spindle of a manufacturing machine; and

a truncated cylindrical centering block provided with a cylindrical surface having a center axis, and a L-shaped cutaway having two planar surfaces forming a 90 degree angle therebetween, at least one of said surfaces passing through said center axis; said centering block adapted to be mounted on a workpiece with said one surface abutting a side edge of the workpiece to be aligned with the center axis of said centering pointer, said alignment being attained by causing said needle member of said centering pointer to move axially by moving said centering block with the workpiece in a direction perpendicular to the center axis of said centering pointer so that said lower point of said needle member contacts and moves along said cylindrical surface with the upward movement of said needle member causing said lever to actuate the measuring device which thereby indicates that alignment has been attained.

4,319,401
REGISTERED GUIDE FOR GRAPHIC REPRODUCTION

Leon W. Jones, 6933 Folsom Oaks Ct., Roseville, Calif. 95678

Filed Mar. 28, 1980, Ser. No. 134,873
Int. Cl.³ B43L 13/20
U.S. Cl. 33—174 B 12 Claims

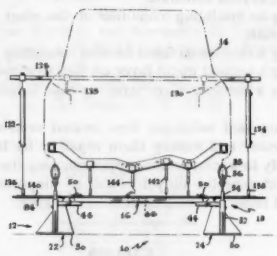
1. A guide for the reproduction of an image onto a work surface and comprised of a shiftable elongated body member of planar form smaller in area than the image to be reproduced and adapted to be moved over said work surface and with spaced registers at opposite sides thereof, one side register for the application of a registration marking onto the work surface and the other side register for registration with said register marking when positioning the body member sequentially from one registered position to the other, there being a multiplicity of delineation means with marking openings through the body member and each identified with a registered position of the body member, the delineation means markings producing the

image upon the work surface multiplied from the body member size by the number of registered positions.

4,319,402
CHASSIS GAGING SYSTEM

William T. Martin, 9583 Geyser Ave., Northridge, Calif. 91324

Filed Jun. 1, 1979, Ser. No. 44,419
Int. Cl.³ G01B 3/38, 5/14, 5/25
U.S. Cl. 33—180 AT 16 Claims



1. A chassis gaging system comprising:

chassis stands for the support of an automotive vehicle;

a locator bed having a panel thereon and a removable replaceable paper carrying grid indicia positioned on said panel, said grid indicia-carrying paper having plumb bob predetermined length information thereon; means for supporting said locator bed beneath the vehicle supported on said stands; and

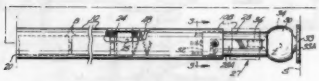
a plumb bob assembly for attachment into a particular reference location opening in the vehicle chassis, said plumb bob assembly having a predetermined length for that particular reference location for having its plumb bob hang freely to said grid indicia on said removable replaceable paper for indicating the deviation of the particular reference location opening in which said plumb bob assembly is attached from the desired configuration of the vehicle chassis by deviation both laterally and lengthwise of said plumb bob from said grid indicia on said paper, said plumb bob assembly being adjustable in length so that its length can be adjusted to said predetermined length in accordance with length information on said paper.

4,319,403

POWER DRILL POSITION INDICATOR

Eugene R. Stearns, 3480 SW. Western Blvd., Corvallis, Oreg. 97330

Filed Sep. 29, 1980, Ser. No. 192,177
Int. Cl.³ B27G *23/00*
U.S. Cl. 33—185 R **10 Claims**



1. A device for use in indicating the relationship of a power tool operating axis to a desired operating axis perpendicular to a work piece surface, said device comprising,

a housing having a forward and a rearward end,

means for mounting said housing on the power tool with the housing axis parallel to the tool operating axis,

visual signal means in place on said housing and in circuit with an electrical power source, and

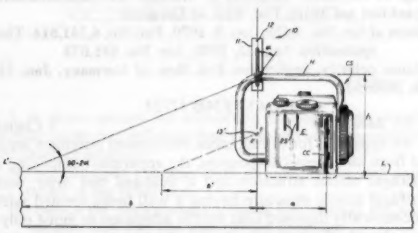
inclination sensing means at the forward end of said housing and including a foot member for work piece surface abutment, a carrier supported by said housing and supporting said foot member for universal movement, electrical contacts concentrically disposed about the axis of the carrier, each of said contacts in circuit with said visual signal means, said foot member and said electrical contacts operable upon lateral displacement of the carrier relative said foot member to close a circuit through one of said contacts and activate said visual signal means to indicate the direction of tool operating axis displacement to aid in the operator's manual return of the tool operating axis to the desired axis perpendicular to the work piece.

4,319,404

CHAIN SAW SIGHTING DEVICE

Helmut E. Brock, Binghamton, N.Y., assignor to David C. Young, Greene, N.Y.

Filed Mar. 20, 1980, Ser. No. 132,283
Int. Cl.³ G02B *23/00*
U.S. Cl. 33—263 **10 Claims**



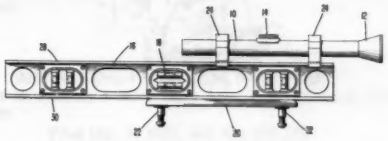
1. A sighting device for a portable saw having a cutting means operable to cut in a cutting plane, comprising, in combination: support means carrying a plane mirror and first line-defining means spaced from said mirror to define a first reference line extending parallel to said mirror, said mirror carrying an indicium defining a second reference line extending parallel to said first reference line; said first and second reference lines defining a first plane; and means for mounting said support means on a saw with said first plane parallel to said cutting plane and providing adjustment of said support means in the direction of said first plane relative to an edge of said cutting means.

4,319,405

LEVELING INSTRUMENT

Orville E. Price, 3186 Stingy La., Anderson, Calif. 96007

Filed Jan. 31, 1980, Ser. No. 117,284
Int. Cl.³ G01C *5/00*
U.S. Cl. 33—292 **8 Claims**



1. A leveling instrument comprising:

(a) a horizontally disposed sighting telescope for sighting along horizontal distances,

(b) a horizontally disposed spirit level frame having a substantially flat planar upper surface and a substantially flat planar lower surface which is substantially parallel to said upper surface, said spirit level frame having at least one bubble level tube mounted therein for indicating the horizontal alignment thereof,

(c) first and second support members for rigidly embracing the sighting telescope at different points thereon and for supporting said sighting telescope horizontally on the upper surface of the spirit level frame by simple abutting contact therewith, each of said support members having a substantially flat planar base surface portion for resting smoothly on the substantially flat planar upper surface of the spirit level frame, said base surface portion being bounded by a downwardly projecting flange member at each lateral edge thereof, and

(d) a horizontally disposed leveling platform having a substantially flat planar top surface for carrying the spirit level frame by simple abutting contact therewith, the substantially flat planar lower surface of said spirit level frame resting smoothly on the substantially flat planar top surface of the leveling platform, said leveling platform further including a bottom surface having a plurality of individually vertically adjustable legs removably attached thereto for supporting the leveling platform on a support surface, each of said individually vertically adjustable legs comprising:

(1) an internally threaded tubular member open at one end thereof and removably attached at the opposite end thereof to the bottom surface of the leveling platform, and

(2) an externally threaded shaft for engaging at one end thereof the open end of said internally threaded tubular member, the opposite end of such externally threaded shaft having a resilient tip for resting on said support surface.

4,319,406

LASER TARGETS FOR ROLLER ALIGNMENT

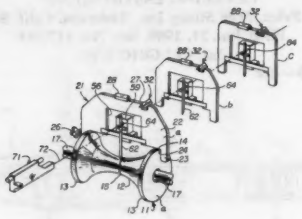
John V. Pehrson, Sr., and Marie S. Pehrson, both of 851 Deming Way, Sparks, Nev. 89431

Filed Sep. 13, 1979, Ser. No. 75,117
Int. Cl.³ G01C *15/12*; C01B *5/25*
U.S. Cl. 33—295 **8 Claims**

1. A target for attachment to a member which is adjustable vertically and horizontally and which member has a pair of first horizontal surfaces and a pair of first vertical surfaces, and

which has a mark between said vertical surfaces, said target comprising

a frame formed with a second horizontal surface shaped to fit accurately upon said first horizontal surfaces, a pair of legs depending from said second horizontal surface and intersecting said second horizontal surface at opposed corners spaced



apart to engage outside said first vertical surfaces, level means on said frame to indicate when said frame is vertical, a block having a hole therein, mounting means mounting said block for accurate horizontal movement transverse to said frame and parallel to the horizontal adjustment of said member, and indicator means on said block indicating the distance of said hole from a vertical line through said mark.

4,319,407

METHOD AND APPARATUS FOR ELECTROSTATICALLY FORMING A LAYER OF MATERIAL FROM A SLURRY THEREOF

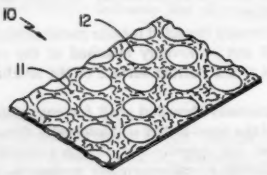
James T. Candor, 5440 Cynthia La., Dayton, Ohio 45429

Continuation of Ser. No. 85,216, Oct. 16, 1979, Pat. No. 4,236,317, which is a continuation-in-part of Ser. No. 849,097, Nov. 7, 1977, Pat. No. 4,189,845, which is a continuation-in-part of Ser. No. 809,945, Jun. 24, 1977, Pat. No. 4,135,307, which is a division of Ser. No. 695,092, Jun. 11, 1976, Pat. No. 4,050,162, which is a continuation-in-part of Ser. No. 541,218, Jan. 15, 1976, Pat. No. 3,977,937, which is a continuation-in-part of Ser. No. 405,023, Oct. 10, 1973, Pat. No. 4,060,449. This application Aug. 4, 1980, Ser. No. 174,886

The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.

Int. Cl.³ F26B *3/34*; D21F *1/64*

U.S. Cl. 34—1 **10 Claims**



1. A method of making a patterned non-woven sheet of material comprising the steps of providing a slurry of liquid and particles of said material, creating an electrostatic field action that acts on said slurry and causes at least part of said particles of material to be arranged into a removable sheet of said material with said particles thereof arranged in a predetermined pattern in contrast to a non-patterned sheet of material wherein the particles thereof are arranged substantially uniformly or randomly, and removing said thus patterned sheet of material from said slurry.

4,319,408

HEATING PROCESS AND ITS APPARATUS IN REDUCING AIR PRESSURE WITHIN A CHAMBER AT A BALANCED LEVEL

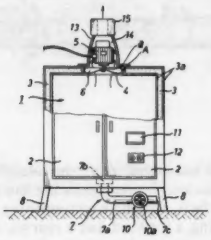
Nobuyoshi Kuboyama, 28-9-1, Shimomiyamori, Aza, Miyamorimura, Kamihei-gun, Iwate-ken, Japan

Filed Oct. 24, 1980, Ser. No. 200,563

Claims priority, application Japan, Jul. 10, 1980, 55-94631; Jul. 10, 1980, 55-97630; Sep. 22, 1980, 55-132065; Sep. 22, 1980, 55-132066

Int. Cl.³ F26B *3/28*

U.S. Cl. 34—15 **11 Claims**



1. A heating process for heating the interior of a chamber at reduced air pressure, said chamber having an outlet, comprising:

forcibly suctioning air from within said chamber by rotary means at said outlet;

discharging forcibly suctioned air outside said chamber by rotation of said rotary means until air pressure within the chamber is reduced to a balanced level;

maintaining a difference between the reduced air pressure within said chamber and the air pressure outside said chamber at said balanced level;

generating air friction heat by continuous rotation of the rotary means, and permitting a substantial portion of said air friction heat to remain inside said chamber whereby said inside of said chamber is heated by the air friction heat at said reduced air pressure; and

controlling a flow rate of air entering said chamber to a value effective to maintain a temperature of air remaining in said chamber at a predetermined level.

4,319,409

APPARATUS FOR DRYING CHLORINATED POLYMERS

Manfred Scholz, Hürth, and Karl Kaiser, Brühl, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 1,455, Jan. 8, 1979, Pat. No. 4,241,514. This application Aug. 25, 1980, Ser. No. 181,073

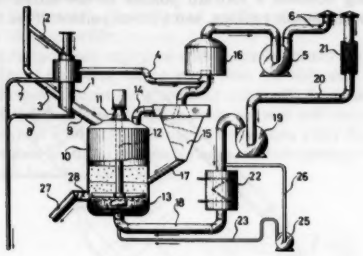
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1978, 2800952

Int. Cl.³ F26B *17/24*

U.S. Cl. 34—58 **3 Claims**

1. An apparatus for drying moist chlorinated polymers separated from an aqueous suspension, the apparatus comprising a centrifugal nozzle structure and a fluidized bed drier; said centrifugal nozzle structure having a wall being formed with an eccentrically disposed inlet for the admission of moist polymers and with a first gas inlet arranged so as to open at an acute angle into the structure through said wall and being cut obliquely in the structure; said wall comprising portions of the kind of a filtering shell permeable to liquid matter, and said filtering shell being concentrically surrounded by an annular chamber having a first discharge conduit in its bottom portion passed through it and a gas outlet communicating with its upper portion; said centrifugal nozzle structure being further formed with an oblique bottom portion permeable to liquid matter, and a chamber being placed below said bottom portion,

said chamber being connected to a second discharge conduit and having an off-gas outlet; said centrifugal nozzle structure being at least formed with a third discharge conduit passed through it in alignment with the oblique bottom portion and being cut obliquely in the structure; said fluidized bed drier comprising a cylindrical shell, a cover, a base portion and a receiving plate; said third discharge conduit being passed



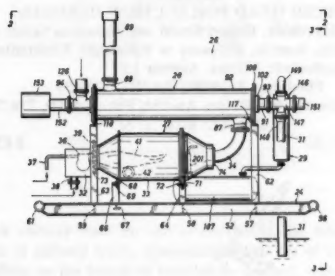
through said cover and opening into the fluidized bed drier; said cover being penetrated by a shaft terminating in an agitator just above said receiving plate; a third gas inlet receiving preheated gas being arranged so as to open into said base portion; a fourth gas inlet being passed through said base portion terminating in an air chest; and a fourth dischage conduit penetrating said cylindrical shell and being closable by means of a flap.

4,319,410

DRYER SYSTEM FOR DRILLING MUD CUTTINGS

Joe K. Heilhecker, and David D. Schoeneman, both of Houston, Tex., assignors to The Brandt Company, Houston, Tex.

Filed Jun. 24, 1980, Ser. No. 162,409
Int. Cl.³ F26B *11/14*
U.S. Cl. 34—75 **34 Claims**



1. A dryer system for converting cuttings from oil based drilling muds into pollution-free solids and oil containing condensibles, comprising:

(a) an elongated chamber with an inlet at one end and an outlet at the other end;

(b) means for continuously feeding the cuttings through a vacuum lock into the inlet of said chamber;

(c) conveyor means for moving the cuttings from said inlet to said outlet of said chamber while continuously agitating the cuttings;

(d) indirect heat exchange means surrounding said chamber and adapted to pass a heated fluid in contact with the exterior of said chamber from the outlet end to the inlet end whereby the cuttings at the outlet end have been heated to a substantially elevated temperature without thermal cracking of said hydrocarbons;

(e) vacuum means for reducing the fluid pressure within said chamber to a magnitude sufficient to vaporize substantially all of the hydrocarbons carried by the cuttings at the elevated temperature conditions at the outlet end of said chamber; and said vacuum means removing fluids from said oultet of said chamber whereby vaporized liquids flow concurrently with the cuttings toward said outlet of said chamber;

(f) means for continuously removing heated cuttings in a hydrocarbon-free condition through a vacuum lock from said outlet of said chamber; and

(g) receiver means for collecting vaporized hydrocarbon and condensing same into a liquid product at said outlet of said chamber.

4,319,411

ASPIRATING PANEL FOR GRAIN BINS

Vincent B. Steffen, 3 N. Walnut Ave., New Hampton, Iowa 50659

Filed Oct. 6, 1980, Ser. No. 194,253
Int. Cl.³ F26B *9/02*
U.S. Cl. 34—233 **6 Claims**

1. A grain bin having a roof, sidewall and floor wherein the improvement to at least one of said roof, sidewall and floor comprises:

a first aspirating panel with first and second edges opposite one another,

a second aspirating panel with first and second edges opposite one another, and

means for spacing apart at a fastening joint, in an overlapping relationship, said edge of the first aspirating panel from said first edge of the adjacently positioned second aspiring panel, to form a venturi like opening between the first and second panels, which allows air within the grain bin to be drawn outside the grain bin via an aspirating action, formed by outside air flowing over the panels to create a low pressure region in the vicinity of the venturi like opening.

4,319,412

SHOE HAVING FLUID PRESSURE SUPPORTING MEANS

Roberto Muller, New York, N.Y., and Antonio M. Sousa, Taunton, Mass., assignors to Pony International, Inc., New York, N.Y.

Filed Oct. 3, 1979, Ser. No. 81,525
Int. Cl.³ A43B *13/20, 13/04, 23/28*
U.S. Cl. 36—29 **8 Claims**

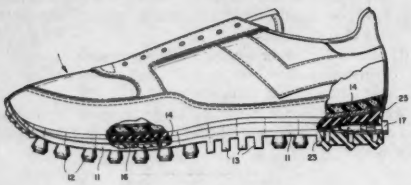
1. A shoe having fluid pressure supporting means, comprising:

a resilient midsole supporting member having (i) a plurality of hollow downwardly depending support posts, the hollows of said posts opening to the upper surface of said member, and (ii) a series of intercommunicating channels formed in said upper surface and communicating with said hollows;

a resilient fluid containing member secured to and covering the upper surface of said midsole and cooperating with said channels to form corresponding conduits for permit-

ting restricted passage of fluid between the hollows of said posts;

valve means for introducing a compressible fluid into said conduits and hollows;



a midsole disposed on the upper surface of said fluid containing member; and

an insole disposed on the upper surface of said midsole.

4,319,413

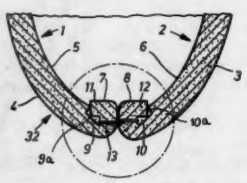
SEAM CONSTRUCTION, PARTICULARLY FOR HEEL PORTIONS OF SHOES AND METHOD OF EFFECTING THE SAME

Klaus Mattil, Höheinöd, Fed. Rep. of Germany, assignor to Prüf-und Forschungsinstitut für die Schuhherstellung, Fed. Rep. of Germany

Filed Apr. 11, 1980, Ser. No. 139,345

Int. Cl.³ A43B *23/00*

U.S. Cl. 36—57 **6 Claims**



1. A seam interconnection for material parts particularly leather parts of shoes, comprising first and second parts to be joined together each having an end edge which is substantially aligned with the end edge of the other part and having one surface with a recess defining a groove having side walls substantially parallel to and spaced inwardly of its associated end edge, a thread seam extending through and joining said first and second parts together extending within the respective grooves of said first and second parts and being parallel to said end edges, each of said parts having marginal areas between the associated groove and the end edge which are bent back upon themselves and engaged in the overlying groove and against a side wall thereof.

4,319,414

DREDGEHEAD HAVING FORWARD WATER-DEFLECTING MEANS COMPRISING TWO TRANSVERSE ELEMENTS

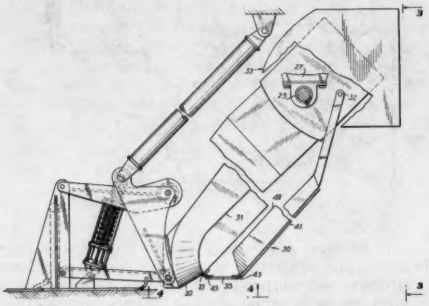
John P. Latimer, Newport News, and Charles Garland, Williamsburg, both of Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Jun. 2, 1980, Ser. No. 155,315

Int. Cl.³ E02F *3/92*

U.S. Cl. 37—58 **7 Claims**

1. A dredge vehicle, capable of moving along the floor of a body of water, the vehicle comprising a chassis, a suction-type dredging nozzle body having a substantially vertically elongated surface facing in a forward direction and a nozzle opening at the bottom of such surface facing in a generally forward direction, the nozzle body being pivotably supported from its top upon the chassis, a water flow-deflecting shield pivotally supported from its top upon the chassis at a location forward of and adjacent to the forwardly facing surface of the nozzle, and a transverse plate forming a continuous surface extending along substantially the entire width of the nozzle and between the forward portion of the nozzle body and the lower portion of the shield surface, the plate being pivotally connected to and extending between a forward portion of the nozzle body, adjacent the nozzle opening, and a lower portion of the shield



surface, the shield having a forward-facing shield surface which angles downwardly rearwardly from the pivotable support so as to downwardly deflect, towards the nozzle opening, a free-flow stream of water impinging upon the forward shield surface, the shield surface, the nozzle body, the transverse plate, and the chassis, forming a parallelogram of elements, whereby rotating any member serves to rotate the other members about an axis parallel to the support surface and perpendicular to the direction of movement, while maintaining the parallelism of opposite members.

4,319,415

CUTTER HEAD FOR SUCTION DREDGES

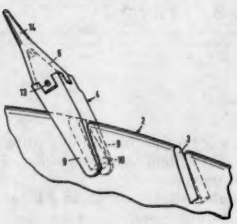
Gottfried Mayerböck; Rupert Strobl, and Sebastian Seiler, all of Kapfenberg, Austria, assignors to Vereinigte Edelstahlwerke Aktiengesellschaft, Vienna, Austria

Filed Jan. 25, 1980, Ser. No. 115,494

Claims priority, application Austria, Feb. 2, 1979, 776/79

Int. Cl.³ E02F *3/92*

U.S. Cl. 37—67 **3 Claims**



1. A cutter head for a suction dredge, especially suction dredge vessels or the like, comprising:

cutter head blade means;

tooth holders welded to the cutter head blade means;

a respective tooth tip carried by a related one of the tooth holders;

each tooth holder having an end region facing away from the tooth tip carried thereby;

said end region having a substantially T-configured profile;

said profile having a web and at least one flange;

each cutter head blade means being provided with slot means for receiving the web of the profile of the related tooth holder;

said slot means coacting with the web of each mounted tooth holder so as to ensure that any subsequently mounted tooth holder and its tooth tip each time will assume an essentially exactly predetermined seated position at the cutter head blade means;

said substantially T-configured profile comprises a double T-shaped profile;

said flange being provided with a reinforcement rib at the side of the flange facing away from the web; and

said reinforcement rib protruding outwardly from said side of the flange facing away from the web and protruding beyond a side of the flange in a direction away from the related tooth tip past such flange, said rib having a thickness less than said flange.

4,319,416

METHOD FOR DRAINING A RAILWAY TRACK AND A RAILWAY TRAIN FOR USE IN SAID METHOD

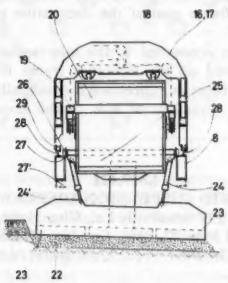
Fredy Scheuchzer, Lausanne, and Fritz Bühler, Ecublens, both of Switzerland, assignors to Les Fils d'Auguste Scheuchzer, S.A., Switzerland

Filed Sep. 17, 1980, Ser. No. 188,113

Claims priority, application European Pat. Off., Nov. 8, 1979, 79810147.3

Int. Cl.³ E01B *37/00, 27/10*

U.S. Cl. 37—104 **4 Claims**



1. A railway train for use in improving the drainage of a length of railway track, comprising a first set of rail cars for travelling on the length of track to be drained, which first rail cars are equipped for excavation and evacuation of the bed of the length of track, and a second set of rail cars for travelling on track adjacent to said length, which second rail cars are equipped for conveying materials for the new bed and the new rails of the length of track and which set comprises a working truck composed of two bogies joined by an empty frame having a length which is greater than the length of a section of rail, one of the bogies being for travelling on said adjacent track and the other bogie being for travelling on said length of track, which working truck is connected to the trucks of the second set of rail cars by tracks for gantries, and two travelling gantries being provided and equipped both with a lifting device for a length of rail and a device for lifting and tipping buckets, and the working truck being equipped with a strip for levelling the bed and a tamper, these two latter pieces of equipment covering the entire width of the bed and being supported by travelling on the two side parts of the empty frame.

4,319,417

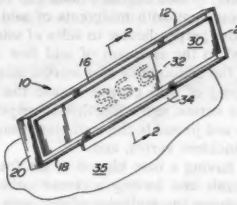
NAMEPLATE DEVICE AND KIT FOR MAKING SAME

Norbert Schimmel, Kings Point, N.Y., assignor to New Hermes Incorporated, New York, N.Y.

Filed Nov. 5, 1979, Ser. No. 91,643

Int. Cl.³ G09F *3/18*

U.S. Cl. 40—10 R **3 Claims**



1. A nameplate device comprising:

(a) a rigid shadowbox having a rear wall connected to a top wall, bottom wall and side walls;

(b) a rigid spacer secured to a central portion of said rear wall within the shadowbox, said rear wall having means thereon for registering the spacer in a central portion thereof, wherein said registering means includes a structure on said rear wall for mating with and positioning said spacer in a predetermined location on said rear wall inwardly of its periphery, said mating structure including an opening recessed in said rear wall, said rear wall being a laminate with the opening extending through one of the layers of the laminate;

(c) a plate having a front face and a rear face, the front face of said plate being engraved, the rear face of said plate being adhesively secured to said spacer, said plate being within the shadow box parallel to the rear wall and spaced inwardly from said top, bottom and side walls.

4,319,418

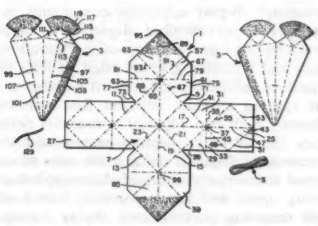
COLLAPSIBLE ORNAMENTAL SOLIDS

Felix Transport, 98 Riverside Dr., New York, N.Y. 10024, assignor to Felix Transport, New York, N.Y.

Filed Jul. 28, 1980, Ser. No. 172,987

Int. Cl.³ G09F *1/00*

U.S. Cl. 40—124.1 **17 Claims**



1. A collapsible polyhedron constructed from a single blank comprising:

a central square;

first and third polygons diagonally opposite each other, each comprising:

first and second congruent right triangles having colinear legs with a coincident vertex, said coincident vertices also coincident with a vertex of said central square, and having hypotenuses hinged to the side of said central square;

an outer square, first and second creases joining a first side of said outer space to the colinear legs of said first and second triangles, a second crease coincident with the median of said outer square perpendicular to said first side, and

third and fourth creases, each of which joins the midpoint of said first side with a midpoint of an adjacent side;

second and fourth polygons diagonally opposite each other, each comprising:

first and second quadrilaterals having a coincident vertex, said coincident vertex also coincident to a vertex of said central square, first sides hinged to consecutive sides, respectively, of said central square and having their endpoints coincident with midpoints of said central square, second sides perpendicular to sides of said central square and joined to the endpoint of said first side, third sides joined to the endpoint of said second side and parallel to the diagonal of said central square that intersects said coincident vertex, and a fourth side perpendicular to said third side and joined to the endpoint of said third side and to the coincident vertex; and

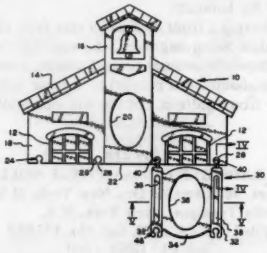
a pentagon having a base hinged to the fourth side of said quadrilaterals and having a crease coincident with the altitude joining the midpoint of said base and said pentagon's apogee and creases coincident with the altitudes from the midpoint of said base to the sides of said pentagon intersecting the apogee.

4,319,419

MOLDED PICTURE FRAME WITH ATTACHABLE DISPLAYS

Gerald L. Traill, 7225 Sears Rd., Horton, Mich. 49246

Filed Jul. 31, 1980, Ser. No. 174,165
Int. Cl.³ G09F *1/12*; A47G *1/16*
U.S. Cl. 40—152.1 **2 Claims**



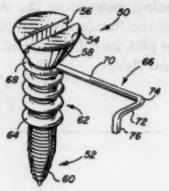
1. Photograph display apparatus comprising, in combination, a primary support member adapted to be supported on a vertical wall having a general plane of configuration, a vertical center axis, and including a lower edge, at least four spaced first connectors defined on said support member at said lower edge, the spacing between adjacent first connectors being equal whereby each two adjacent connectors define a set of connectors, the set of connectors nearest said vertical axis being horizontally disposed on opposite sides of said vertical axis an equal distance, a plurality of photograph display frames each having upper and lower portions, lateral sides, and a photgraph receiving portion, said display frames having a horizontal width no greater than one half of the horizontal width of said primary support member, a pair of second connectors defined on each frame at said upper portion thereof in horizontal spaced relation forming a set and a pair of third connectors defined on each frame at said lower portions thereof in horizontal spaced relation forming a set, said second connectors defined upon a display frame being vertically oriented directly above and in alignment with said third connectors defined upon the associated frame and adjacent the lateral sides of the associated display frame, the spacing between said second connectors comprising a set and the spacing between said third connectors comprising a set being equal and equal to the spacing between said first connectors whereby photograph display frames may be selectively connected to said first connector sets by said second connectors in a variety of locations with respect to said lower edge including in alignment with said vertical axis and on opposite horizontal sides of said vertical axis, and vertically adjacent display frames may be interconnected by said second and third connectors thereof.

4,319,420

CANVAS FRAME SPRING TENSION WIRE CLAMP APPARATUS

Robert E. Clinton, 6403 S. 5th Ave., Phoenix, Ariz. 85041

Filed Jan. 8, 1981, Ser. No. 223,250
Int. Cl.³ G09F *1/12*
U.S. Cl. 40—156 **10 Claims**



1. Clamp apparatus for securing a canvas stretching frame to a decorative frame, comprising, in combination:

screw means, including

a shank, including a threaded portion for securing to the decorative frame, and

a head adjacent the threaded shank; clip means secured to the screw means, including

an extension arm extending from the screw means to the decorative frame,

intermediate arm means connected to the extension arm and disposed on the stretcher frame for biasing the stretcher frame against the decorative picture frame, and

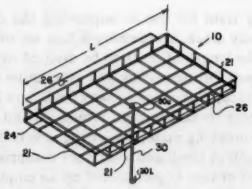
an outer arm connected to the intermediate arm means and disposed on the stretcher frame for biasing the stretcher frame in a direction substantially perpendicular to the direction of bias of the intermediate arm means.

4,319,421

CEILING GRID SUSPENSION DISPLAY DEVICE

Sidney Diamond, 199 Brookville La., Glen Head, N.Y. 11545

Filed May 27, 1980, Ser. No. 153,357
Int. Cl.³ G09F *7/22, 7/18*; B42F *13/00*
U.S. Cl. 40—617 **1 Claim**



1. A portable display device formed of a size and shape to fasten between and to special laterally spaced-apart support members of a suspended tile panel ceiling, where each of said spaced-apart support members is formed with a flange upon which an edge of a ceiling tile may freely rest, said display device being formed with first means to rest on the flanges of two said adjacent laterally spaced-apart support members, and with second means to which a detachable hooked hanging member may be detachably fastened, in which

said first means consist of at least one pair of spaced detent

members that each extend away from each other in opposed directions and shaped so that each said detent member may rest on a flange of an individual spaced-apart support member, and in which

each said detent member is fixed to a rim on the periphery of the device and shaped to extend outwardly in a direction away from the remainder of the device, in which

the device is in the form of an open basket of unitary structure,

said basket formed of a grid of spaced-apart and intersecting shaped wire members, which wire members serve as the second means, with the rim of said device being fixed to the basket about the periphery of said basket, and with said rim being located on an upper portion of said basket so that a lower section of the wire members extend below said rim, to form a lower portion of said basket such that in use, with the detent members resting on flanges of spaced-apart support members, edges of a ceiling tile may freely rest on the said detent members, with the lower portion of said basket extending below said ceiling tile, so as to serve as said second means with a ceiling tile in place.

4,319,422

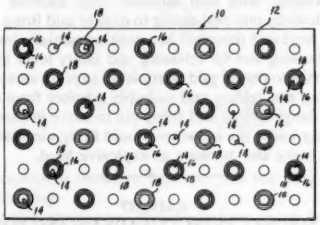
BULLETIN BOARD

Seymour Robins, Boardman St., Sheffield, Mass. 01257

Continuation of Ser. No. 683,889, May 6, 1976, abandoned, which is a continuation of Ser. No. 499,173, Aug. 21, 1974, abandoned. This application Sep. 10, 1979, Ser. No. 73,942

Int. Cl.[3] **G09F** *7/06, 7/12;* **B65D** *69/00*

U.S. Cl. 40—622 **17 Claims**



1. A bulletin board for receiving thumbtacks and push pins and the like including in combination a plurality of elements each formed of a material into which the pointed shaft of a thumbtack may be inserted, each element having a pair of generally planar and generally parallel surfaces of relatively small area, each element having a height between said surfaces sufficient to accommodate full insertion of the shaft of a thumbtack, means providing a generally flat and simply connected bonding surface, and means including a thin layer of adhesive for securing a major portion of the area of one planar surface of each element to and substantially flush against the bonding surface, said elements being secured to the bonding surface in a non-abutting relationship such that between elements there remains a permanently uncovered and visibly exposed space of the bonding surface which is at least a significant portion of the square root of the area of said surface of an element.

4,319,423

BARRIER STRUCTURE FOR CONTROLLING GROUND CRAWLING, NON-BURROWING INSECTS

Melvin L. Judd, 35411 252nd S.E., Auburn, Wash. 98002

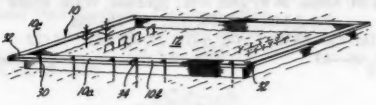
Filed May 27, 1980, Ser. No. 153,449

Int. Cl.[3] **A01M** *1/10*

U.S. Cl. 43—121 **13 Claims**

1. An article of manufacture for use in controlling worm-like, ground crawling, non-burrowing insects such as slugs, snails, moth and butterfly larva, worms and the like, comprising:

a barrier structure made of an elongate web of substantially rigid flat mesh material that is folded lengthwise so that in transverse section the web has the shape of an inverted L including a vertical wall segment having a lower edge, a horizontal wall segment joined to an upper extent of said vertical wall segment and projecting horizontally and outwardly therefrom, and a lip segment formed along an



outboard edge of said horizontal wall segment and oriented to depend downwardly therefrom substantially at right angles to said horizontal wall segment, said barrier structure being adapted for installation so that said vertical wall segment forms relative to the ground a vertical obstruction to such insects and so that the horizontal wall segment and lip segment are elevated above ground and together present a non-traversible barrier to those insects which have crawled up the vertical wall segment and along the underside of the horizontal wall segment.

4,319,424

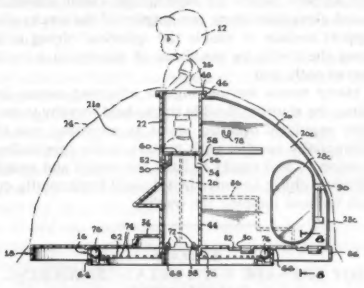
PLAY HOUSE APPARATUS

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356, and Nancy D. Middleton, Van Nuys, Calif., assignors to Adolph E. Goldfarb, Tarzana, Calif.

Filed Feb. 14, 1980, Ser. No. 121,643

Int. Cl.[3] **A63H** *3/00, 3/52*

U.S. Cl. 46—12 **15 Claims**



1. A doll play set comprising:

(a) a separate, essentially full length doll figure having a full height, said figure having a lower leg portion and an upper body portion including at least a head,

(b) a separate, open, generally dome-shaped doll house which comprises:

(1) a generally horizontal floor having an outer edge;

(2) at least one upstanding wall mounted on and extending generally transversely of the floor to define at least two separate play areas, said wall having an upper edge that increases in height as it progresses in a direction away from the outer edge of the floor, the wall having a maximum height greater than the full height of the doll figure whereby the doll figure can be used for play within said doll house; and

(3) means on the wall for supporting the doll figure with said upper portion of the doll figure extending above the doll house and said lower leg portion disposed within the outline of said doll house; and

(c) a separate removable cover having generally the shape

defined by the wall of said doll house and having an opening for the doll figure to extend upwardly through when said cover is assembled on said doll house and said doll figure is supported by said support means on said doll house, said cover simulating the appearance of an enlarged skirt for said doll figure.

4,319,425
GRAVITY OPERATED TRACK

Thomas M. Shine, 36 E. 28th Ave., Spokane, Wash. 99203

Filed May 1, 1980, Ser. No. 145,688
Int. Cl.³ A63H *33/00*; A47G *29/00*; A62C *31/22*
U.S. Cl. 46—43 **6 Claims**

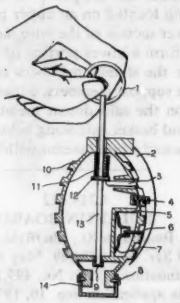
1. A gravity operated toy track comprising:
a spherical object such as a marble;
a pair of elongated cylindrical tubular sections formed of flexible tubular wall material such as garden hose having prescribed outer diameters;
a clamp means for releasably securing the cylindrical tubular sections together in abutting longitudinal relationship at spaced intervals along their lengths to form flexible tracks for receiving the spherical object thereon;
clamp support means for holding the clamp means at selected elevations along the lengths of the tracks above a support surface to enable the spherical object to move along the tracks by the force of gravity in a vertically curved path; and
said clamp means having angular adjusting means for enabling the abutting flexible tracks held thereby to be manually angularly oriented about an adjusting axis that is substantially parallel with respect to the longitudinal dimension of said tracks to bank the tracks and enable the spherical object to move in a desired horizontally curved path without jumping the tracks.

4,319,426
TOY GRENADE WITH DELAY-TRIGGERING MECHANISM

Kwang H. Lee, 218 Kwang Ming Rd., Peitou District, Taipei, Taiwan

Filed Feb. 11, 1980, Ser. No. 120,299
Int. Cl.³ A63H *5/00*
U.S. Cl. 46—200 **6 Claims**

1. A toy hand grenade, comprising:
a hollow casing;
a firing pin extending into said casing and having a firing pin ring at a first end thereof outside of said casing for grasping to pull said firing pin axially thereof outwardly of said casing, and said firing pin ring preventing said firing pin from traveling completely into said casing;
a flange on said firing pin intermediate said first end and a second end of said firing pin and within said casing;
a safety lever mounted externally on said casing and mounted for pivoting toward and away from said casing;
a movable stop member extending into said casing and positioned for being moved by said safety lever when said safety lever is pivoted toward said casing to travel toward and engage said firing pin flange and prevent said firing pin from traveling into said casing further than the position where said flange is engaged by said movable stop member, and said stop member movable to disengage said firing pin flange when said safety lever pivots away from said casing to allow said firing pin to travel further into said casing;
means for detonating an explosive head with said second end of said firing pin;
firing pin biasing means for biasing said firing pin toward said explosive head to strike and detonate said explosive head with said firing pin second end;
safety lever biasing means for biasing said safety lever to pivot away from said casing; and

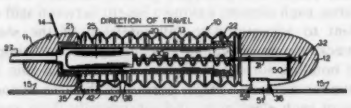


holding and releasing means for holding said safety lever at a position with said movable stop member extending sufficiently into said casing to engage said firing pin flange and hold said firing pin in a position partially inserted into said casing and for releasing said safety lever after a time interval to permit said safety lever to pivot away from said casing and release said movable member from said firing pin flange to free said firing pin to move inwardly of said casing under the influence of said firing pin biasing means and strike and detonate an explosive head.

4,319,427
MAGNET EFFECTED ADVANCING TOY

Lee V. Way, Jr., 46 Robert Oaks Dr., Newark, Del. 17913

Filed Apr. 20, 1981, Ser. No. 255,771
Int. Cl.³ A63H *33/26*
U.S. Cl. 46—241 **7 Claims**



1. An apparatus adapted to releasably hold and step itself on a surface formed of a permanent magnet attracting material, said apparatus comprising:
(a) a pair of magnet assemblies, each assembly comprising:
(i) a permanent magnet adapted to being magnetically coupled to said surface in a slidably engaging relation;
(ii) a magnetic flux shielding member also adapted to being magnetically coupled to said surface in a slidably engaging relation; and
(iii) a structure formed of a material and in a manner adapted to maintain the magnetic coupling of said magnet and shielding member to said surface when in a coupled relation thereto and mounting said magnet and shielding member on said structure in a manner enabling said magnet and shielding member to move with respect to each other within defined limits of travel enabling

said magnet to be magnetically shielded and unshielded to control magnetic adhesion of said assembly to said surface;

(b) structural means mounting said magnet assemblies in a manner enabling the shielding member and magnet of each assembly to reciprocate relative to each other and each said assembly to be restrained in movement when its respective magnet is fully shielded while the other magnet of the other said assembly is less shielded and said other assembly moves relative thereto; and

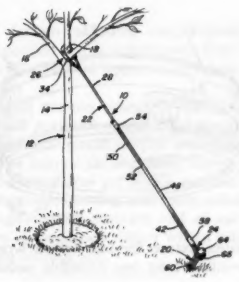
(c) actuator means mounted on said structural means and adapted to effect repetitive relative movements of said magnets and shielding members and in conjunction with said structural means to effect step-by-step motion of said apparatus over said surface in a predetermined direction.

4,319,428

ADJUSTABLE TREE TIE DOWN

Daniel W. Fox, 202 E. Sharon, Phoenix, Ariz. 85022

Filed Dec. 28, 1979, Ser. No. 107,881
Int. Cl.³ A01G *17/06*
U.S. Cl. 47—42 **4 Claims**



1. An adjustable tie-down for trees and the like, said tie-down comprising:

an elongated, continuous, flexible, hollow center line;

hook means attachable to a portion of and being remotely located from a first end of said line;

first loop means formed proximate to said first end of said line;

first sleeve means concentrically positionable over and being slidable along a portion of said line between said first loop means and said hook means;

second loop means selectably formable to effect a positioning of said first sleeve means about a tree and the like, said second loop means being formed by engaging said first loop means with said hook means to accomplish said positioning;

third loop means formed in a portion of said line and being of an adjustable construction, said third loop means being attachable to a stake and the like to effectively secure said tie-down in an operable position, said loop means being formed by a doubled back portion of said line with a second end thereof being inserted through strands forming a periphery of said line into said hollow center thereof and being directed along a predetermined longitudinal length thereof within said hollow center, said second end then exiting to an exterior portion of said line;

second sleeve means concentrically positionable over and being slidable along a portion of said doubled back portion of said line located between said third loop means and a point of insertion of said second end of said line into said hollow center;

third sleeve means concentrically positionable over and being slidable along a portion of said doubled back portion of said line located between said second end and a point where said second end exits from said hollow center; and

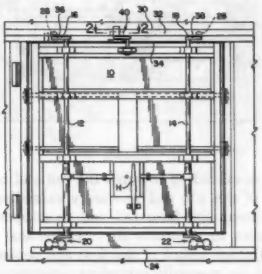
stop means formed on said second end whereby said third sleeve means is prevented from becoming slidably disengaged from said doubled back portion of said line.

4,319,429

AUXILIARY CRANK END

Robert F. Seitz, Mentor, Ohio, assignor to The Youngstown Steel Door Company, Cleveland, Ohio

Filed Aug. 25, 1980, Ser. No. 180,864
Int. Cl.³ E05D *15/10*
U.S. Cl. 49—220 **8 Claims**



1. In a railway house car having openings along its sides, doors for closing said openings by movement along said car sides and laterally into and out of said openings;

bottom and top rotating crank means moveably supporting and retaining said doors adjacent the lower portions of said doors on longitudinal track means and adjacent the upper portions of said doors within longitudinal retainer means;

means to rotationally drive at least some of said crank means for selective lateral movement of said doors, the improvement comprising;

said longitudinal retaining means including a downwardly extending front flange and a laterally outwardly extending lower flange below and spaced from said front flange by an amount sufficient to permit passage of an elongated and generally horizontally oriented intermediate portion of said top crank means;

one of said top crank means including a front sled moveably engaging the inner surface of said downwardly extending front flange; and,

said one top crank means including a bottom sled moveably engaging the upper surface of said laterally outwardly extending lower flange laterally outwardly of said front sled and said inner surface of said downwardly extending front flange it engages.

4,319,430

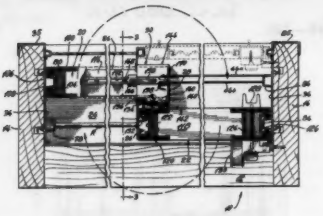
SLIDING CLOSURE ASSEMBLY

Jacques Menard, Laval, Canada, assignor to Preciform Inc., Laval, Canada

Filed May 28, 1980, Ser. No. 153,966
Int. Cl.³ E05D *15/06*; E06B *1/04*
U.S. Cl. 49—404 **5 Claims**

1. A sliding panel assembly comprising a frame having a pair of jambs, a lintel and a sill, the sill having a sloped drainable surface, a panel receiving rail extending longitudinally of the sill, at least a first and second panel being interchangeable and each having a bottom and an upper sash, said first panel being mounted on said rail for sliding movement, the second panel being mounted parallel and adjacent the first panel but in a fixed relation to the frame with one of the vertical sashes of the second panel in weather-sealing engagement with one of the

jambs of the frame; said second panel being mounted on the down slope side of the sill relative to the first panel, a removable false rail provided on the sill and seating the lower horizontal sash of the second panel, a mullion member comprising weather-stripping being removably mounted to the other vertical sash of the second member, said mullion member adapted to act as a weather-seal between adjacent vertical sashes of the panels when the panels are in a closed position, and a sash block removably mounted to the sill and located below the other sash of the second panel, the sash block having a wedge-



shaped portion extending towards the rail and corresponding to the slope of the sill, and upwardly extending projections adapted to extend the false rail and to cooperate with the mullion member to complete the weather-seal between the respective adjacent sashes of the first and second panels and the sill, one of the upwardly extending projections being in the form of a reversible insert such that when the fixed panel is mounted to the other side of the frame with the other sash weather-sealingly engaging the other vertical jamb, the sash block and mullion can be adapted to the one sash of the panel.

4,319,431

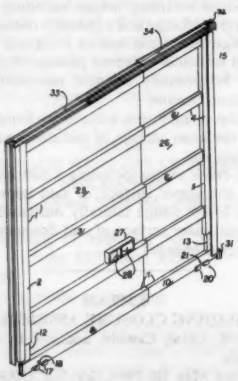
ADJUSTABLE BOXCAR DEVICES

Gerald D. Siers, 8611 Wooded Glen, Louisville, Ky. 40208

Filed Dec. 13, 1979, Ser. No. 103,391

Int. Cl.³ E05D *13/02*

U.S. Cl. 49—426 **4 Claims**



1. An adjustable door device for use in railroad boxcars which is adjustable as to height and width and includes first and second frame means each including a vertical tubular member having a plurality of horizontal tubular members extending therefrom, wherein the horizontal tubular members of the first frame means telescopingly receives the horizontal tubular members of the second frame means so that the horizontal length of the assembled first and second frame means is adjustable; roller assembly means including horizontal first and second tubular members wherein the first tubular member telescopingly receives the second tubular member for horizontal adjustment of said roller assembly means, roller means within each of the first and second tubular members comprising yoke means centrally pivoted within the first and second tubular members adjacent the ends thereof and wheels rotatably mounted at each end of the yokes, said rollers extending through openings in the bottoms of said tubular members; upstanding legs on the tops of the first and second tubular members of the roller assembly means adjacent the ends thereof which are received in the vertical tubular members of the first and second frame members wherein the vertical height of said first and second frame means is vertically adjustable with respect to the roller assembly means; and wherein the said first and second frame means includes telescoping top track means at the upper edge thereof.

4,319,432

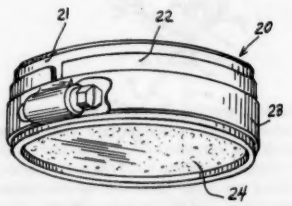
POLISHING FIXTURE

Lawrence Day, Mt. Prospect, Ill., assignor to Spitfire Tool and Machine Co., Chicago, Ill.

Filed May 13, 1980, Ser. No. 149,348

Int. Cl.³ B24B *7/22, 37/04*

U.S. Cl. 51—131.4 **5 Claims**



1. A retaining fixture for use with a workpiece polishing assembly having at least one rotatable polishing member including;

(a) a circular workpiece chuck for positioning the workpiece in place to be polished by the assembly,

(b) at least one workpiece engaging face provided by said chuck for receiving the workpiece to be polished,

(c) means provided by the assembly for maintaining said chuck in a stationary position relative to the rotating polishing member while the workpiece positioned thereby is polished by the rotating polishing member,

(d) a reversible, replaceable workpiece retainer embracing the periphery of said chuck and adjustable relative thereto so as to provide an edge exposed beyond the bottom surface thereof for containing the workpiece between the workpiece engaging face and the rotating polishing member, and

(e) a means encircling said retainer for maintaining the same on the periphery of said chuck and for permitting adjustment and reversing of said retainer relative to said workpiece engaging face of said chuck.

4,319,433

TOOL FOR CUTTING AUTOMOTIVE COMPONENTS

Robert K. Nolen, Chicago, and David J. Leehaug, West Chicago, both of Ill., assignors to Maremont Corporation, Chicago, Ill.

Filed Sep. 24, 1979, Ser. No. 77,919

Int. Cl.³ B24B *23/02, 55/04;* **B27B** *9/02*

U.S. Cl. 51—170 PT **8 Claims**

1. A tool for use in cutting parts of automotive components, such as exhaust systems, shock absorber units and the like, to facilitate removal and replacement of said components, said tool comprising

a portable housing of a size and shape to be manually gripped by a user,

an air motor within said housing including an output shaft

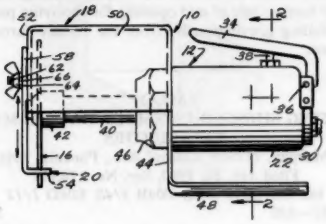
extending generally longitudinally outwardly of one end of said housing,

manually actuated means for selectively communicating a source of air under pressure with said air motor to operate the same and rotatably drive said output shaft,

a thin cutting disc fixed concentrically on said shaft longitudinally in spaced relation with respect to said housing, and

a protective shield structure molded of transparent rigid plastic material, said shield structure including

an annular wall portion fixed to said one end of said housing in longitudinally spaced relation from one side of said cutting disc,



a finger guard portion extending longitudinally from said annular wall portion in a direction away from said cutting disc in generally parallel coextensive relation with said housing,

a peripheral shield portion extending longitudinally from said annular wall portion in annularly spaced relation with respect to said finger guard portion in a direction toward said cutting disc beyond the periphery thereof in covering relation with a substantial peripheral portion thereof, and

an outer wall portion extending generally radially inwardly from the longitudinally outward end of said peripheral shield portion in covering relation with a substantial face portion of said cutting disc.

4,319,434

SURFACE PROCESSING MACHINE

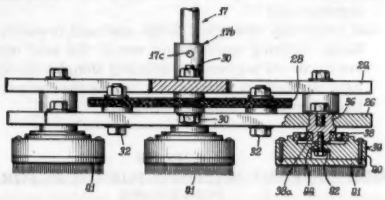
Robert J. Brejcha, Westchester, Ill., assignor to R/B Manufacturing, Inc., Westchester, Ill.

Filed May 8, 1980, Ser. No. 147,560

The portion of the term of this patent subsequent to May 22, 1996, has been disclaimed.

Int. Cl.³ B24B *23/00*

U.S. Cl. 51—177 **16 Claims**



1. An apparatus for processing a surface comprising:

motor drive means mounted on a frame for rotatably driving a surface processing assembly;

a surface processing assembly connected to said motor drive means, said surface processing assembly including

a pair of coaxially disposed and interconnected three-arm spiders;

flexible coupling means interconnecting said pair of spiders,

a surface processing tool rotatably connected to the end of each spider arm,

means for freely rotatably mounting each of said surface processing tools at the end of each spider arm on an axis substantially parallel to the axis of rotation of said surface processing assembly.

4,319,435

BLASTING MACHINE FOR DEBURRING WORKPIECES

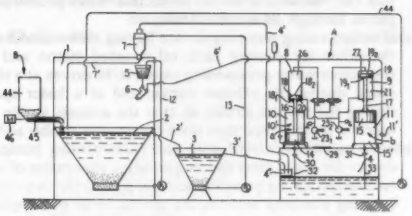
Shigenobu Suzuki; Kooichi Hayashi; Chiaki Hayashi; Toshiyuki Takagi, all of Shizuoka, and Shigeharu Kobayashi, Yokohama, all of Japan, assignors to Fuji Seiki Machine Works, Ltd., Sunto, Japan

Filed May 2, 1980, Ser. No. 146,542

Claims priority, application Japan, May 17, 1979, 54-059725

Int. Cl.³ B24C *3/12, 3/22, 7/00, 9/00*

U.S. Cl. 51—421 **9 Claims**



1. In a wet blasting machine for deburring, said machine having means defining therein a blasting chamber, blasting gun means positioned within said chamber for discharging a slurry of water and abrasive particles against a workpiece, a reclaiming tank located below the blasting chamber for collecting therein the slurry, a clear water tank containing therein a quantity of clear water, pump means for supplying clear water to said blasting gun means to create a water jet stream which functions as the driving force for ejecting a slurry of water and abrasive particles from said gun means, and means for supplying the slurry containing said abrasive particles to said gun means, the improvement comprising:

settling tank means for receiving therein water from the upper portion of said reclaiming tank, said settling tank means permitting further solid particles to be settled therein, and means for supplying water from the upper portion of said settling tank means to said clear water tank;

said supplying means including reservoir means containing therein said slurry having a concentration of abrasive particles associated therewith, said reservoir means being disposed above said reclaiming tank and positioned at an elevation approximately equal to or above the elevation of said blasting gun means;

said supplying means also including conduit means extending from the bottom portion of said reservoir means to said gun means for supplying abrasive particles thereto, and slurry pumping means for supplying the slurry as accumulated within said reclaiming tank to said reservoir means;

said pump means comprising a reciprocating pumping device having at least two reciprocating pumping sections which are driven in an out-of-phase relationship to continuously supply an uninterrupted stream of pressurized water to said blasting gun means;

each said reciprocating pumping section including a double-acting oil cylinder means having a reciprocal oil-actuated piston, and a water-pressurizing cylinder means having a reciprocal water-pressurizing piston, said water-pressurizing piston being connected to and driven by said oil-actuated piston;

said water-pressurizing cylinder means including first conduit means associated therewith and communicating with said clear water tank for sucking water from said tank during the suction stroke of the water-pressurizing piston, and second conduit means connected to said blasting gun

means for supplying pressurized water thereto during the exhaust stroke of said water-pressurizing piston;

said reciprocating pumping device including first oil circuitry means connected to the oil cylinder means of both pumping sections, and having a first pressure pump associated therewith, for supplying pressurized oil to one side of the oil cylinder means to thereby move the oil-actuated pistons in one direction so as to cause the corresponding water-pressurizing piston to be driven through its exhaust stroke;

said reciprocating pumping device including second oil circuitry means connected to the oil cylinder means of both pumping sections, and including second pressure pump associated therewith, for supplying pressurized oil to the other side of the oil cylinder means to individually move the oil-actuated pistons in the opposite direction so that they thereby drive the respective water-pressurizing piston through its suction stroke;

said reciprocating pumping device having means associated thereafter for causing each oil-actuated piston and its respective water-pressurizing piston to be driven at a slow speed during the exhaust stroke, and at a faster speed during the suction stroke, so that the exhaust stroke requires a greater time than does the suction stroke; and

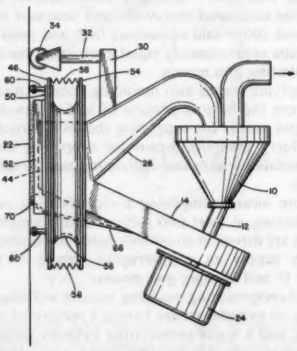
control means associated with said reciprocating pumping device for controlling the reciprocating movement of said two reciprocating pumping sections so that the two reciprocating pumping sections are moved in an out-of-phase relationship such that at least one of the reciprocating pumping sections is supplying pressurized water to said gun means at all times, said control means causing the initial piston displacement of one reciprocating pumping section during its exhaust stroke to overlap with the terminal piston displacement of the other reciprocating pumping section when the latter is completing its exhaust stroke, whereby the suction stroke of the other reciprocating pumping section occurs wholly during a central portion of the exhaust stroke of said one reciprocating pumping section, and vice versa.

4,319,436

PORTABLE BLASTING DEVICE AND SEALING MEANS

Harvey G. Van Fossen, Mishawaka, Ind., assignor to Wheelabrator-Frye, Inc., Mishawaka, Ind.

Filed Feb. 4, 1980, Ser. No. 117,843
Int. Cl.³ B24C *3/06, 9/00*
U.S. Cl. 51—424 **10 Claims**



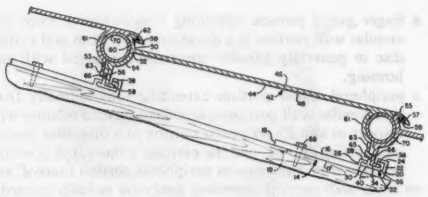
1. In a portable blasting device having a head with an opening through which the particulate material is projected at high velocity onto a vertically disposed surface for surface treatment and in which the particulate material is characterized by magnetic attraction, means for building up and maintaining a sealed relation between the blast head and the surface about the top and sides of the opening comprising a support plate mounted for movement relative to the blast head about the opening, magnetic members mounted on the support plate about the top and sides of said opening, means constantly urging the support plate in the direction toward the surface and guide means extending a predetermined distance from the support plate to maintain the spaced relation between the magnetic members on the support plate and the surface whereby particulate material is held by magnetic attraction to form a seal of particulate material between the blast head and the surface about the top and sides of the opening, leaving an open space between the blast head and the surface extending substantially across the bottom side of said opening, and means below the bottom side of said opening for receiving particulate material falling gravitationally from the surface through said open space.

4,319,437

ROOFING SHINGLE ASSEMBLY HAVING SOLAR CAPABILITIES

John A. Murphy, 7273 N. Central Ave., Phoenix, Ariz. 85020

Filed Jan. 24, 1980, Ser. No. 114,917
Int. Cl.³ F24J *3/02*; E04B *5/48*; E04D *1/12*
U.S. Cl. 52—220 **5 Claims**



1. An extruded metal roofing shingle for mounting in multiple shingle, edge overlapping, parallel array fashion on laterally spaced rafters of a building structure or the like, said shingle comprising:

an elongated flat main portion, having upper and lower surfaces and laterally opposed upper and lower curved segments, said curved segments each defining half circular portions which, when interconnected with an adjacent shingle define fluid conduit enclosing means;

fluid conduit means enclosed within said interconnected curved segments of adjacent shingles;

an outwardly extending flange on said lower curved segment and an inwardly turned flange on said upper curved segment; and

said outwardly extending flange and said inwardly turned flange defining interlocking means for said upper and lower curved segments of adjacent shingles for forming a tight mechanical interlocking connection between overlapping edges of adjacent shingles.

4,319,438

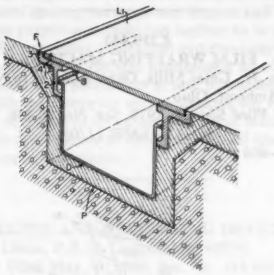
SHAPED FRAME MATERIAL FOR USE IN FORMING PIT FRAMES

Kiichiro Mikajiri, Ooita, Japan, assignor to Yugen Kaisha Shinnihon Seisakusho, Ooita, Japan

Filed May 8, 1980, Ser. No. 149,111
Int. Cl.³ E04B *5/48*
U.S. Cl. 52—221 **5 Claims**

1. A shaped frame material for use in forming a pit frame, comprising: a first support member having first and second flat supporting surfaces on the front and rear sides thereof, respectively; a second support member formed integrally with and extended at right angles from one end portion of said first support member, and having a substantially cross-sectionally C-shaped lengthwise-extended recess in the front side thereof and a third flat supporting surface on the rear side thereof; and

a vertical edge member formed integrally with and extended at right angles from the other end portion of said first support member, the height of said vertical edge member measured from said first supporting surface, the height of said first support member measured from said second supporting surface and the height of said second support member measured from said third supporting surface being different from one another;



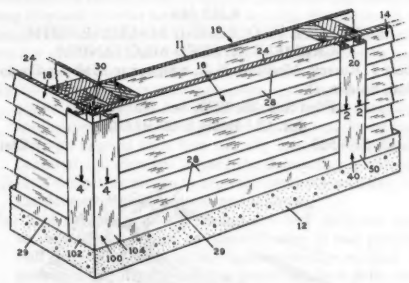
any of the first, second and third flat supporting surfaces being usable to form three different kinds of pit frames whereby the first, second or third flat supporting surface is able to support three kinds of lid members of different thickness with the upper surface of said lid members being held flush with the upper surface of one of said first, second and third flat supporting surfaces.

4,319,439

METHOD OF FINISHING THE EXTERIOR WALL OF A PREFABRICATED BUILDING AND TRIM THEREFOR

Christopher H. Gussow, Durham, N.C., assignor to Hunter Douglas, Inc., Totowa, N.J.

Filed May 5, 1980, Ser. No. 146,676
Int. Cl.³ E04F *19/02, 13/06;* E04B *1/00*
U.S. Cl. 52—288 **16 Claims**



1. In this method of finishing the exterior of factory prefabricated exterior building wall components, which wall components each have an assembled frame, sheathing and siding applied to the exterior of the wall component, and in which said siding includes a plurality of horizontally arranged elongated panels and a J-shaped channel member extending vertically of the wall component at each end of the horizontal panels with the ends of the panels positioned within the channel of the J-shaped channel member, and all of the above having been preassembled in a factory, the improvement comprising:

(a) assembling a plurality of wall components at the building site with the vertical edge of one component adjacent to the vertical edge of an adjacent component, which vertical edges form a joint;

(b) positioning a support member over said joint and between the J-shaped channel of one component and the adjacent J-shaped channel of the adjacent component;

(c) securing said support member to at least one of said wall components; and

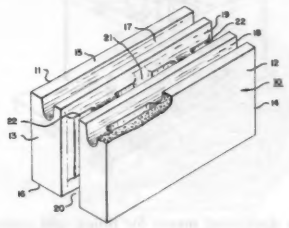
(d) securing a finishing trim to said support member in a position such that said finishing trim overlies at least a portion of the short leg of each of said adjacent J-channels.

4,319,440

BUILDING BLOCKS, WALL STRUCTURES MADE THEREFROM AND METHODS OF MAKING THE SAME

John N. Rassias, 305 E. 86th St., New York, N.Y. 10028, and Cecily M. Clark, 565 Park Ave., New York, N.Y. 10021

Filed Oct. 11, 1979, Ser. No. 83,764
Int. Cl.³ E04C *2/04*
U.S. Cl. 52—438 **11 Claims**



1. A substantially rectangular masonry building block having a pair of spaced opposite generally parallel side walls, spaced top and bottom faces and a pair of end faces, an intermediate generally centrally extending horizontal groove in the top face, a pair of narrower horizontally extending grooves, one on either side of said centrally extending groove on said top face, an intermediate generally centrally extending groove in the bottom face on the center line of the groove on the top face, a generally flat land on each side of said intermediate groove in the bottom face adapted to span and overlie the two narrower grooves in the top face of a next subjacent block, an intermediate vertical passage of generally keyhole shape in said block having a central portion corresponding in width over substantially its length to the widest portion of the central grooves on said top and bottom faces, and at least one leg portion extending lengthwise of and narrower than said grooves, said vertical passage connecting said central grooves, at least one generally elongate rectangular rounded end vertical passages on each side of said intermediate keyhole vertical passage extending from the top narrower grooves to the bottom face and offset longitudinally for said central passage and a vertical recess in at least one end intermediate the side walls connecting said central grooves and having a cross section substantially equal to one half of said intermediate vertical passage.

4,319,441

AUTOMATIC DISPENSING SYSTEM

W. S. Credle, Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Continuation of Ser. No. 69,529, Aug. 24, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,484
Int. Cl.³ B65B *1/04, 61/26*
U.S. Cl. 53—131 **15 Claims**

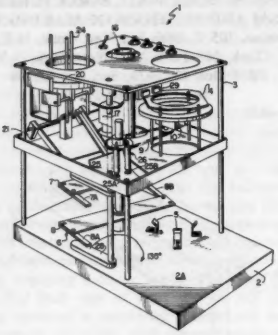
1. An apparatus for automatically filling a container with preselected ingredients and capping said container to form a package comprising;

surface means for supporting said container, said surface means having a plurality of stations disposed in a substan-

tially circular path, through which said container passes in a predetermined sequence;

container dispensing means for automatically positioning an empty container at one of said stations in said circular path;

rotary arm means having a container receiving pocket on at least one end thereof, said pocket moving through said circular path as said arm means rotates, engaging said empty container at said one station and sequentially moving said container through each of the remaining ones of said plurality of stations;



ingredient dispensing means for filling said container with said preselected ingredients at the next one of said plurality of stations in said sequence;

lid applicator means for automatically capping the filled container at still another one of said stations as said container moves along through said circular path;

ejecting means for removing the capped and filled container from said surface; and

drive means for moving said rotary arm means and said pocket thereon in a continuous motion through all of said plurality of stations without stopping said pocket at any stations except when filling said container and ejecting the same.

4,319,442

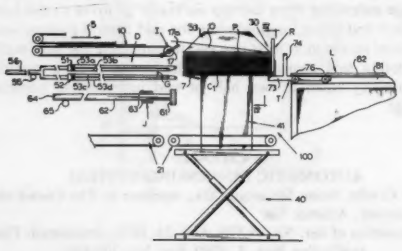
CONTINUOUS ON MACHINE REAM CARTONING

Kenneth G. Frye, South Egremont, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Jan. 21, 1980, Ser. No. 113,721

Int. Cl.³ B65B *35/50*

U.S. Cl. 53—447 **18 Claims**



1. A method of cartoning sheet piles in a stacker, said method comprising:

continuously delivering and piling sheets seriatim in a stacker,

loading a carton having an open top into said stacker to receive sheets therein,

suspending said carton in said stacker on a first support means,

transferring support of said carton in said stacker from said first support means to a second support means,

withdrawing said first support means from said stacker, and

transporting said carton on said second support means from said stacker for discharge after a predetermined sheet pile has accumulated in said carton.

4,319,443

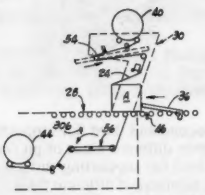
FILM WRAPPING MACHINE

Ridley Watts, Jr., Gates Mills, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Sep. 28, 1979, Ser. No. 80,138

Int. Cl.³ B65B *11/08*

U.S. Cl. 53—466 **9 Claims**



4. In a method of wrapping an article with a heat-sealable film, including the steps of extending the film across a path of article movement, moving an article along the path and into the film so the film extends over front and two adjacent surfaces of the article, bringing the film together behind the article, and sealing and severing the film, the improvement comprising bringing the film together behind the article in a path that has a component in the direction of article movement, and adjusting the path to provide a greater component with tall articles than with short.

4,319,444

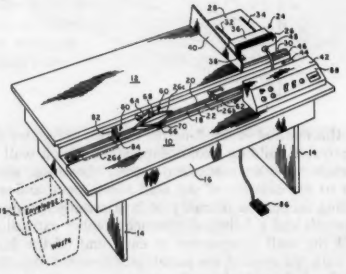
ENVELOPE PROCESSING MACHINE WITH INCREMENTAL FEED MECHANISM

Robert J. Russell, Medford, N.J., assignor to Mail-Ex Corporation, Skokie, Ill.

Filed Sep. 26, 1979, Ser. No. 78,919

Int. Cl.³ B65B *5/00, 43/30*

U.S. Cl. 53—569 **7 Claims**



1. An envelope processing machine adapted for manual insertion or removal of envelope contents comprising: an envelope hopper for storing a quantity of envelopes to be processed; an envelope processing station spaced from said hopper a distance sufficient to have an envelope located therebetween in advance of the processing station; a table top surface adja-

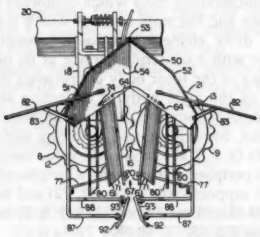
cent said processing station providing a work surface for an operator; incrementing belt conveyor means extending beside said table top surface for conveying the envelopes in relatively closely spaced relationship in contact therewith from said hopper to said processing station, said conveyor means being arranged for incrementally conveying the envelopes a predetermined distance in immediate and close succession to at least one intermediate stop position at the said envelope location between said hopper and said processing station to thereby allow sufficient spacing between said hopper and said processing station to permit said table top surface to be dimensioned therealong for providing a sufficient and elongate work surface area for an operator while still maintaining an efficient envelope processing rate; and means at said processing station and operable with the conveyor means stopped for engaging and opening an envelope at its initial position in contact with the stopped conveyor means to facilitate manual insertion or removal of envelope contents.

4,319,445

GUIDE AND DEFLECTING DEVICE

Kenneth R. Coats, R.R. 3, Odessa, Mo. 64076

Filed May 19, 1980, Ser. No. 151,516
Int. Cl.³ A01D *45/02*
U.S. Cl. 56—63 **34 Claims**



1. A guide and deflecting device for use with a detasseling mechanism in the removal of tops of plants having leaves and being disposed in rows having equal spacing therebetween and where the detasseling mechanism has a nip and is positioned on a tractor means adapted for traveling in a line of motion parallel the rows of plants; said device comprising:

(a) tassel centering means engageable with tops of successive plants and adapted for placement before the detasseling mechanism; said centering means having a pathway therethrough aligned such that laterally spaced plant tops are centered and directed toward the detasseling mechanism;

(b) leaf deflecting means to urge the plant leaves away from the detasseling mechanism; and wherein;

(c) said deflecting means includes a leaf deflector guide secured to said device on opposed sides of said pathway, said guides each including a substantially vertical and generally flat first sub-member extending forwardly therefrom in a direction generally parallel with the tractor line of motion, said guide first sub-member engaging the leaves of said plants and deflecting them from said pathway.

4,319,446

INFEED MEANS FOR ROUND BALER

John Arnold, Coldwater; Wilbur E. Groeneveld, Celina, and Warner Heckley, Rockford, all of Ohio, assignors to The Paul Revere Corporation, Greenwich, Conn.

Filed Jun. 23, 1980, Ser. No. 162,372
Int. Cl.³ A01D *39/00*
U.S. Cl. 56—341 **4 Claims**

1. A machine for forming round bales of fibrous crop material gathered from a windrow, comprising:

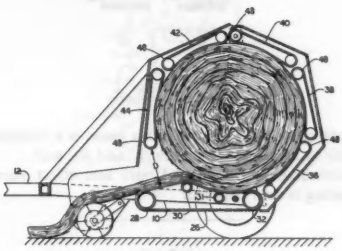
a single axle chassis;

skeletal frame members attached to the chassis and defining a horizontal generally cylindrical baling zone, said frame including a pair of upwardly extending sidewalls spaced apart in the horizontal direction to form the two ends of the baling zone, said frame including a stationary front part and a rear part hinge mounted to said front part on the upper portion of said sidewalls so as to form a tailgate which can be swung upward from a closed to an open position for discharge of a completed bale;

pickup reel means transversely mounted across the lower front of said chassis;

bottom conveyor means extending between said sidewalls for receiving crop material from said pickup reel and delivering it to said baling zone, the rearmost portion of said bottom conveyor defining the lower side of said baling zone;

a plurality of serially arranged conveying elements disposed around the periphery of the upwardly extending sidewalls, some of said conveying elements being in said hinge



mounted rear part, said conveying elements being disposed around the circumferential periphery of the generally cylindrical baling zone;

drive means for moving both the bottom conveyor and said serially arranged conveying elements, the direction of movement being from front to rear through the bottom of said baling zone, thence such as to carry crop material upward along the rearmost side; and

an inlet gap into the baling zone extending transversely between said sidewalls, said gap being between said bottom conveyor and the downstream edge of the last serially arranged conveying element, the bottom conveyor being arranged to provide a straight-line path from the top of said pickup reel to the forward lower edge of said baling zone, said bottom conveyor extending beyond the forward entrance to said baling zone and providing thereby frictional urging of the crop strands to enter said baling zone, the height of said inlet gap being selected to minimize plugging of the entrance region.

4,319,447

METHOD OF FORMING A BULKY YARN

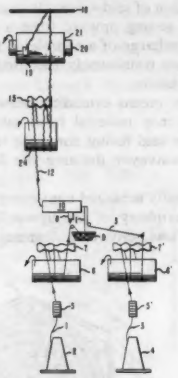
Eugene R. Barron, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 18,527, Mar. 8, 1979, Pat. No. 4,248,036. This application Aug. 8, 1980, Ser. No. 176,371
Int. Cl.³ D02G *3/34;* D02J *1/08*
U.S. Cl. 57—6 **3 Claims**

1. A method for producing a bulky continuous filament yarn in which continuous filament core yarns of polymeric material comprising from about 65 to about 93 percent of the total filaments by weight are substantially straight and free from loops and the remainder of the total filaments being continuous filament effect yarns having a denier per filament of up to 5.0 which are inserted between the filaments of the core yarn and protrude from the surface of the core yarn in a mixture of crunodal and arch-like loops, the method comprising

(a) pretreating the core yarn by application of water;

(b) feeding the core yarn to a texturing jet at an overfeed of about 1.5 to about 7.0 percent;
(c) while simultaneously feeding the effect yarn to said jet at an overfeed of about 20 to about 60 percent;



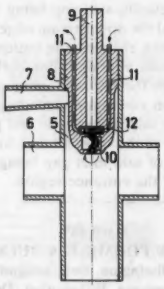
(d) combining said core and effect yarns in a turbulent flow of air at ambient temperature in said jet; and
(e) tensioning said combined core and effect yarn while winding it on a package.

4,319,448

PROCESS AND APPARATUS FOR PRODUCING YARN

Ryszard Jóźwicki; Bogdan Kluska; Czesław Radom, and Jan Pacholski, all of Łódź, Poland, assignors to Instytut Włokiennictwa, Łódź, Poland

Filed Apr. 2, 1980, Ser. No. 136,445
Claims priority, application Poland, Apr. 13, 1979, 214921; Sep. 1, 1979, 218093
Int. Cl.³ D01H *1/13*
U.S. Cl. 57—58.89 **3 Claims**



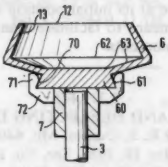
1. A spinning device for forming a yarn comprising a spinning chamber provided with tangential airducts for operation on the axially stationary air vortex principle, and a rotatably mounted false-twisting means separated from the spinning chamber on the yarn withdrawal side thereof and adapted to receive yarn from the spinning chamber, the false-twisting means being shaped so as to enable transmission of torque to yarn withdrawn from the spinning chamber in a direction identical to the direction at which the air ducts are tangent to the spinning chamber, said false-twisting means is provided with vanes in communication with air entering the spinning chamber, the vanes being so shaped and arranged that upon rotation thereof by the air current entering the spinning chamber the false-twisting means is rotated.

4,319,449

OPEN END SPINNING ROTOR COMPRISING A MAIN BODY AND A ROTOR BODY

Eberhard Hofmann, Ingolstadt, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Sep. 17, 1980, Ser. No. 188,217
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1979, 2939326
Int. Cl.³ D01H *1/12*
U.S. Cl. 57—58.89 **10 Claims**



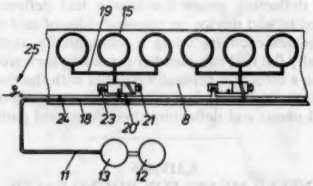
1. An open end spinning rotor which comprises a main body and a rotor body and the main body of which is carried by a mounting and drive element and has a substantially radial support surface with a centering surface at its outer edge, a centering surface of the rotor body cooperating with the centering surface of the main body, a collecting surface being provided in said rotor body and an open edge remote from said centering surface, comprising: said centering surfaces (**21, 70**) in the main body (**2, 5, 7, 8, 9**) and in the rotor body (**1, 4, 6**) are in the form of a peripheral groove and a peripheral rib, respectively, and said support surface (**20, 52, 72**) and the centering surfaces (**21, 70**) of said main body (**2, 5, 7, 8, 9**) have substantially radial slots (**22, 55, 71, 80, 90**).

4,319,450

PNEUMATICALLY CUSHIONED SPINNING RING SYSTEM

Wolfgang Igel, Ebersbach, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 904,907, May 11, 1978, abandoned. This application Jun. 27, 1978, Ser. No. 919,455
Claims priority, application Fed. Rep. of Germany, May 12, 1977, 2721360
Int. Cl.³ D01H *7/56, 15/00, 1/24*
U.S. Cl. 57—261 **6 Claims**



1. In a method of starting an individual stopped spinning ring of a ring spinning machine or doubling machine which is in operation and has a plurality of spinning rings which are rotatably supported on pneumatic cushions and have been set in rotation by respective travelers and in which compressed air has initially been admitted into the bearing gaps between the spinning rings and their support bearings in the ring frame when the spinning rings are stationary, to produce an air cushion adapted to support the spinning rings, and in which the

admission of compressed air is interrupted when the spinning rings, which are adapted to draw in air, are themselves able to draw in the air required for maintaining the air cushion after reaching a minimum rotational speed, the improvement which comprises the steps of:

admitting compressed air to the support bearings of at least the said individual stopped spinning ring;

entraining the stopped ring rotatably by its traveler into rotation and increasing the speed of the ring at least to said minimum rotational speed; and

cutting off the compressed air feed to said individual ring upon its attainment of said minimum speed.

6. In an apparatus for ring spinning or doubling, the combination which comprises:

(a) an elongated ring rail;

(b) a multiplicity of ring assemblies spaced along said ring rail, each of said assemblies including:

(b_1) an annular ring holder, and

(b_2) a ring rotatable relative to said holder and defining a gap therewith, each of said rings being entrainable by a traveler thereon engaged by a thread rotatable by a respective spindle;

(c) a source of compressed air;

(d) first means connecting said source with all of said gaps simultaneously for supporting all of said rings on respective air cushions to enable rotation of the rings, said first means being disconnectable from said gaps and said rings being constructed to induce air into the respective gaps upon rotational entrainment of said rings; and

(e) second means connected with said source and selectively connectable with said gaps for admitting air to the gap of at most only a part of the assemblies to which said first means is connected, thereby enabling restarting of an assembly of said part suffering thread breakage.

4,319,451
METHOD FOR PREVENTING OVERHEATING OF AN EXHAUST PURIFYING DEVICE

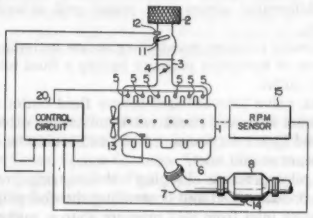
Masahiko Tajima, Takahama; Yasuo Sagisaka, Kariya; Toshio Kondo, Anjo, and Akio Kobayashi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 19, 1980, Ser. No. 131,765

Claims priority, application Japan, Apr. 4, 1979, 54-40732

Int. Cl.³ F01N *3/20*; F02B *75/10*

U.S. Cl. 60—274 **2 Claims**



1. A method of preventing overheating of an exhaust purifying device positioned in the exhaust system of an internal combustion engine comprising the steps of:

sensing the operating conditions of said internal combustion engine;

sensing the temperature of said exhaust purifying device;

comparing said sensed temperature with a predetermined value;

reading a storage value stored in an addressable storage location of a read/write memory, said one of an addressable storage location being addressed in correspondence with said sensed operating conditions;

correcting said storage value in increasing and decreasing directions in response to the result of said comparing step;

writing said corrected storage value in said one of an addressable storage location of said read/write memory; and

controlling the oxygen concentration in the exhaust gas flowing into said exhaust purifying device in accordance with said corrected storage value.

4,319,452
SECONDARY AIR SUPPLY DEVICE

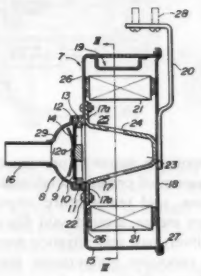
Hideo Morita, Yokohama, and Yoshio Iwasa, Nagareyama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 6, 1979, Ser. No. 72,927

Claims priority, application Japan, Sep. 12, 1978, 53/125262[U]; Dec. 21, 1978, 53/177236[U]

Int. Cl.³ F01N *3/10*

U.S. Cl. 60—293 **11 Claims**



1. A secondary air supply device for supplying clean air to an exhaust gas passage, said device including:

a secondary air supply air cleaner including a cleaning element having clean air and unpurified air sides;

a secondary air passage communicating said clean air side of said air cleaner element with said exhaust gas passage;

a reed valve located in said secondary air passage;

a silencer extending at least partially around said air filter on said cleaner element unpurified air side; and

means defining a chamber on said air cleaner element clean air side, between said cleaner element and said reed valve, said chamber means comprising two expansion chambers, said device thereby supplying said secondary air through said silencer, said air cleaner element, said two expansion chambers and said reed valve to said exhaust gas passage, wherein said air cleaner for the secondary air comprises: a unitary casing means for receiving said reed valve and said cleaner element therein and for forming said expansion chambers; a cover for the casing; and a reed valve support, said support having one end fixed to said casing for holding said reed valve and the other end fixed to said cover for holding said cleaner element to form said two expansion chambers, and said silencer forming a tubular passage along an inner circumferential surface of an outer wall of said air cleaner on unpurified secondary air side.

4,319,453
DIESEL EXHAUST PARTICULATE AND ORGANIC VAPOR EMISSION CONTROL

Gamdur S. Mann, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 6, 1980, Ser. No. 119,144

Int. Cl.³ F01N *3/02*

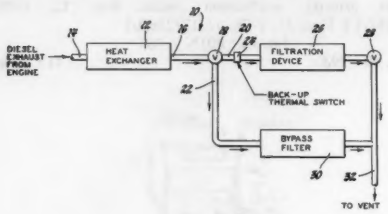
U.S. Cl. 60—309 **4 Claims**

1. A diesel engine exhaust filtration system operative to remove particulates and heavy organic vapors from exhaust gases, said system comprising

heat exchange means connectable with a diesel engine to receive exhaust gases therefrom and operative to cool at

least a major portion of said received exhaust gases to a temperature level at which a major portion of heavy organic vapors in the gases are condensed, thereby causing their adsorption onto the largely carbonaceous particulates entrained in diesel exhaust gases,

filtration means comprising a filter element of relatively low temperature resistance connected with the heat exchange means to receive cooled exhaust gases therefrom and operative to filter out of the gases a substantial portion of the entrained particulates, whereby the condensed vapors adsorbed thereon are also removed,



temperature responsive means to prevent excessive heating and revaporization of organic condensate retained in the filtration means, said temperature responsive means including bypass means around said filtration means and operative to divert past said filtration means exhaust gases retaining an excessive temperature level after passing through the heat exchanger, and

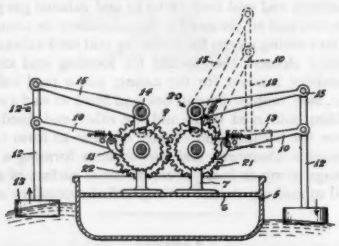
means operative to block passage through said filtration means to exhaust gases having a temperature level higher than the temperature resistance level of said filter element.

4,319,454

WAVE ACTION POWER PLANT

Louis V. Lucia, 5200 N. Ocean Blvd., Apt. 1110, Fort Lauderdale, Fla. 33308

Filed Oct. 9, 1979, Ser. No. 82,681
Int. Cl.³ F03B *13/12*
U.S. Cl. 60—506 **3 Claims**



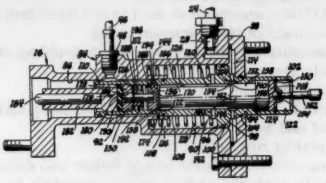
1. A wave action power plant mounted on a floatable carrier and comprising a rotatable drive shaft, a drive lever pivoted on said shaft and extending therefrom over the side of said carrier, a floatable weight depending from the free end of said lever and actuated by passing waves to rock said lever, means on said shaft actuated by rocking movement of said lever to drive said shaft, said lever being swingable to locate said weight in a raised position with its bottom accessible from aboard said carrier, and releasable means for retaining said weight in said raised position.

4,319,455

HYDRAULIC POWER BRAKE SYSTEM AND HYDRAULIC BRAKE BOOSTER AND CONTROLS THEREFOR

Malvin L. Schubert, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1979, Ser. No. 16,208
Int. Cl.³ B60T *13/00*
U.S. Cl. 60—547 R **3 Claims**



1. A hydraulic pressure suspended power brake booster and controls therefor, comprising:

a booster having a housing with a bore therethrough, a power piston reciprocably movable in said housing bore and defining therewith first and second chambers on opposite sides of said piston and also defining an exhaust chamber, a pressure inlet continually communicating with said first chamber and a pressure outlet continually communicating with said exhaust chamber, and means drivable by said piston for actuating a brake system;

said booster having a control valve therein, said control valve having a closed center portion which when operated provides fluid communication between said second chamber and said exhaust chamber, said control valve also having an open center portion controlling fluid communication between said first and second chambers;

and means for maintaining hydraulic pressure within a predetermined range to said inlet and said first chamber and when said booster is inactive also through said control valve open center portion to said second chamber;

said booster being actuated by movement of said control valve to close said control valve open center portion and then open said control valve closed center portion to modulate pressure from said second chamber to said pressure outlet through said exhaust chamber, creating a pressure differential across said piston and actuating said booster;

said hydraulic pressure maintaining means including

a source of hydraulic pressure having a fluid inlet and a fluid outlet,

a check valve between said source fluid outlet and said pressure inlet, said check valve preventing pressure loss should hydraulic pressure from said source be less than pressure at said inlet,

and a pilot pressure charging valve sensing pressure at said pressure inlet and controlling the charging of said pressure inlet from said pressure source, said charging valve communicating hydraulic pressure from said source upstream of said check valve with said source fluid inlet when the charging pressure of said pressure inlet reaches a desired value.

4,319,456

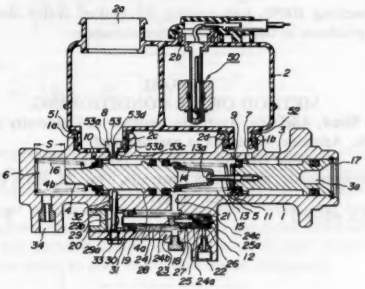
TANDEM MASTER CYLINDER WITH A LIQUID PRESSURE CONTROL VALVE

Hitoshi Kubota, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 13, 1980, Ser. No. 121,151
Claims priority, application Japan, Feb. 14, 1979, 54-15016
Int. Cl.³ B60T *11/20*
U.S. Cl. 60—562 **1 Claim**

1. A tandem master cylinder with a liquid pressure control

valve, comprising a cylinder body having a cylinder hole and an outlet port for rear wheel brake liquid pressure; a primary piston and a secondary piston disposed in said cylinder hole of said cylinder body, said primary piston adapted to generate a rear wheel brake liquid pressure in response to depression of a brake pedal, and said secondary piston adapted to respond to movement of said primary piston so as to generate a front wheel brake liquid pressure; a liquid pressure control valve disposed in said cylinder body between said cylinder hole and said outlet port for rear wheel brake liquid pressure, said liquid pressure control valve including means for making a rate of increase of said rear brake liquid pressure smaller than that of said front wheel brake liquid pressure by selectively closing a liquid passage from said cylinder hole to said outlet port; and means, responsive to an excessively large stroke of said secondary piston at a loss of front brake system, for keeping said liquid



pressure control valve at an open position thereof for opening said liquid passage to increase the rear wheel brake liquid pressure to overcome the loss of front brake system, said keeping open means including:

a plunger in said liquid pressure control valve which plunger is movable between an open position permitting liquid flow between said cylinder hole and said outlet port and a closed position blocking flow between said cylinder hole and said outlet port, and

means by which the excess stroke of said secondary piston causes said plunger to be in said open position, said causing means comprising a valve-opening rod engaging a projection of said secondary piston during said excess stroke of said secondary piston and being pivotally movable to cause said plunger of said liquid pressure control valve to move into its open position.

4,319,457

HYDRO-PNEUMATIC BRAKE CYLINDER DEVICE FOR MOTOR VEHICLE BRAKE SYSTEMS

Friedrich Gross, Seelze; Guenther Meise, Hanover, and Herbert Unger, Springe, all of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 1, 1980, Ser. No. 136,239

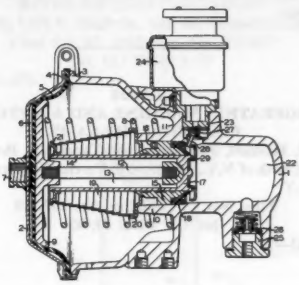
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1979, 2913265

Int. Cl.³ F15B *15/18*

U.S. Cl. 60—593 **7 Claims**

1. A hydro-pneumatic brake cylinder device having a pneumatic cylinder and a hydraulic cylinder comprising a fluid pressure chamber combined in a common housing with an open end; a guide member secured in said housing between said hydraulic and pneumatic cylinders and having a guide bore therein; a hydraulic piston operatively disposed in said guide bore and having a closed end projecting into said fluid pressure chamber of said hydraulic cylinder; a pneumatic piston operatively disposed in said pneumatic cylinder and engageable with said hydraulic piston; a cover closing said open end of said housing and defining in cooperation with said pneumatic piston a pressure chamber; an inlet at said cover via which compressed air is supplied to said pressure chamber to actuate said pneumatic piston in a brake application direction; and an outlet at said hydraulic cylinder via which hydraulic fluid is transmitted in response to actuation of said hydraulic piston by said pneumatic piston; wherein the improvement comprises:

(a) said hydraulic piston being a cylindrical plunger having



a cavity formed in the end opposite said closed end, wherein the bottom of said cavity is formed with a spherically-shaped recess that lies in a plane that intersects the periphery of said plunger within the area thereof encircled by said guide bore; and

(b) said pneumatic piston having a push rod with a spherically-shaped end engageable with said spherically-shaped recess in said bottom of said cavity to provide said engagement between said pneumatic and hydraulic pistons and to accommodate pivotal motion of said pneumatic piston.

4,319,458

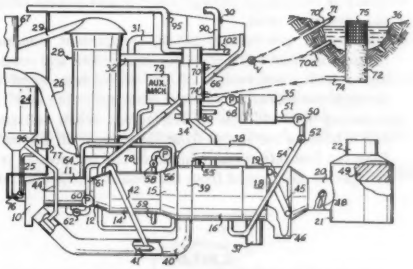
MULTIPLE PRESSURE BOILER WITH ENERGY RECOVERY SYSTEM

James R. Berkley, 585 Hardendorf Ave., NE., Atlanta, Ga. 30307

Continuation-in-part of Ser. No. 32,397, Apr. 23, 1979, abandoned. This application Nov. 26, 1979, Ser. No. 97,533

Int. Cl.³ F28B *7/00*

U.S. Cl. 60—693 **13 Claims**



1. A multiple pressure boiler, comprising means for producing hot gases, a first boiler section including heat exchange means for receiving said hot gases and transferring heat from said hot gases to water in said first boiler section to raise the water in said first boiler section to a first temperature and cause said first boiler section to be at a first pressure, a second boiler section including heat exchange means for receiving said hot gases from said first boiler section and transferring heat from

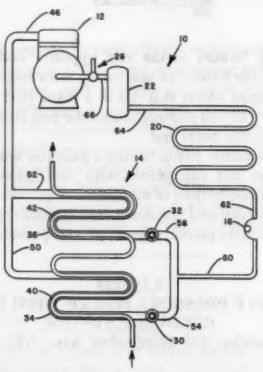
said hot gases to water in said second boiler section to raise the water in said second boiler section to a second temperature and cause said second boiler section to be at a second pressure, means for admitting water to said second boiler section for heating, means for removing heated water from said second boiler section and admitting said heated water to said first boiler section, and second temperature being above the boiling point of water and said second pressure being above atmospheric pressure, said first temperature being above said second temperature and said first pressure being above said second pressure.

4,319,459

REFRIGERATION MACHINE AND A METHOD OF CHARGING THE SAME

William J. Hannett, Jamesville, and Thomas E. Brendel, Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 7, 1980, Ser. No. 205,208
Int. Cl.³ F25B *45/00*
U.S. Cl. 62—77 **5 Claims**



1. A method of charging a refrigeration machine having first and second parallel refrigerant condenser coils, the method comprising the steps of:

adding refrigerant to the machine;

conducting refrigerant through the first and second refrigerant condenser coils;

condensing a percentage of the refrigerant conducted through the first refrigerant condenser coil, and condensing a lesser percentage of the refrigerant conducted through the second refrigerant condenser coil; and

terminating the addition of refrigerant when refrigerant vapor bubbles are absent from the refrigerant discharged from the first refrigerant condenser coil but present in the refrigerant discharged from the second refrigerant coil.

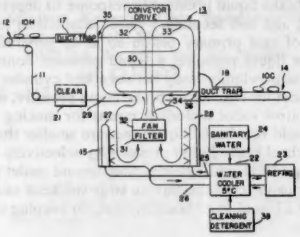
4,319,460

HIGH HUMIDITY FOOD CHILLING SYSTEM

Charles E. Williams, Moorefield, W. Va., assignor to Hester Industries, Inc., Moorefield, W. Va.

Division of Ser. No. 60,987, Jul. 26, 1979, Pat. No. 4,271,683. This application Sep. 3, 1980, Ser. No. 183,718
Int. Cl.³ F24F *3/16*
U.S. Cl. 62—78 **7 Claims**

1. The method of chilling warm food products to a sanitary storage temperature approaching 0° C. comprising the steps of chilling water to said temperature, spraying the chilled water as the sole coolant medium into an air convection stream in a location isolated from the food products to attain a humidity



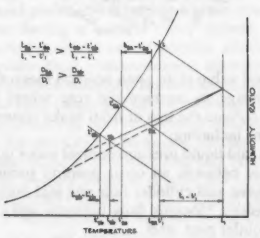
approaching 100%, and passing the chilled water about the food products in the air convection stream.

4,319,461

METHOD OF AIR CONDITIONING

Allan Shaw, Adelaide, Australia, assignor to University of Adelaide, Adelaide, Australia, a part interest

Filed Dec. 18, 1979, Ser. No. 101,256
Claims priority, application Australia, Mar. 28, 1979, PD8226
Int. Cl.³ F25D *17/06*
U.S. Cl. 62—93 **5 Claims**



1. A method of conditioning air in a space to maintain a design condition of temperature and humidity of the air within that space by removal of sensible and latent heat from supply air by passing said supply air through a heat exchanger functioning as a dehumidifier, said method comprising:

reducing specific enthalpy by passing said supply air over relatively cold heat exchange surfaces of said dehumidifier and so arranging the face velocity of the air at entry to the dehumidifier to lie between 0.4 and 2 meters per second, the equivalent hydraulic diameter of the compact heat exchanger surface of the heat exchanger (D_e) and the mass velocity of air per unit are (G_m) being such that the maximum Reynolds number of the supply air (D_eG_m/μ where μ is the viscosity of the supply air) during its passage over the heat exchanger surface is between 100 and 2000, and maintaining said design condition without reheat but solely by said supply air.

4,319,462

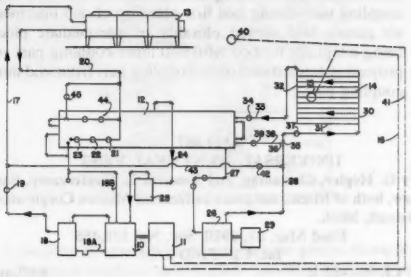
REFRIGERATION SYSTEM FOR HEAT EXCHANGERS SUCH AS USED IN ICE RINKS AND THE LIKE

Arnold H. V. Foster, 85 - 22nd St. East, Prince Albert, Saskatchewan, Canada

Filed May 12, 1980, Ser. No. 148,980
Claims priority, application Canada, May 22, 1979, 328216
Int. Cl.³ A63C *19/10*
U.S. Cl. 62—235 **9 Claims**

1. A refrigeration system for cooling a flooded evaporator

system in a medium to be cooled such as an ice rink or the like, comprising in combination an evaporator, a compressor, and an externally situated condenser operatively connected to said flooded evaporator system, means to circulate liquid refrigerant from said evaporator, through said flooded evaporator system and back to said evaporator on demand, means selectively to route refrigerant vapor from said evaporator through



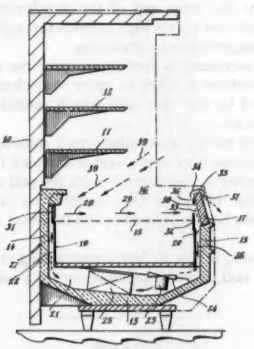
said compressor and said condenser and back to said evaporator to change said vapor to liquid and means to selectively pump liquid refrigerant from said evaporator through said condenser and back to said evaporator when the ambient temperature around said condenser is a pre-determined amount below the ambient temperature of said flooded evaporator system in order to cool down said liquid refrigerant.

4,319,463

REFRIGERATED DISPLAY CHEST

Hans G. Ljung, Bjärred, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Oct. 15, 1979, Ser. No. 84,877
Claims priority, application Sweden, Oct. 20, 1978, 7810952
Int. Cl.[3] A47F *3/04*
U.S. Cl. 62—256 **9 Claims**



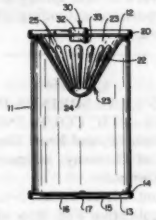
1. In an open top display chest for cold or frozen goods, said chest being provided with insulated walls, one of said walls having a transparent portion, an open top container having vertical side walls within said walls, a space between said walls and said container being an air circulation channel for circulating air around the goods as well as across the goods at the open top thereof, an exhaust opening between the top of said vertical wall and the top of said transparent portion of the adjacent insulated wall, cooling element means in said channel, fan means reversing the direction of air flow in said channel, and said fan means directing a larger quantity of air per unit time during defrosting than during cooling; the improvement comprising an edging positioned above one of said insulated walls to form a diversion channel spaced above the top of said adjacent wall, one of said vertical side walls of said container terminating at its upper end a certain distance below said edging, said diversion channel being positioned to direct exhaust air away from said cabinet in a direction more than 90° from the horizontal surface on which air is flowing across the top of the goods in a cooling mode.

4,319,464

REFRIGERATED CONTAINER

N. Ray Dodd, 1494 N. High St., Apt. 14, Columbus, Ohio 43201

Filed Jul. 25, 1980, Ser. No. 172,367
Int. Cl.[3] F25D *3/08*
U.S. Cl. 62—371 **9 Claims**



1. A beverage container having an inside and an outside for refrigerant inside comprising:

a. an enclosure for a beverage material constructed of a plurality of connected side and end walls with one of the end walls forming a wall of a pressure vessel for a refrigerant material inside the container;

b. the pressure vessel being formed of the one end wall and a conically formed member extending into the container from the one end wall;

c. a frangible valve formed in an aperture in the one end wall, the valve being formed of plastic material and secured in the aperture, the valve having an extended portion contiguous with the end wall and closed at the end, providing a flowline conduit for the refrigerant material, the extended portion having a serration to facilitate breaking of the extended portion and release of the refrigerant material by vaporization; and

d. a diffuser in the conduit to diffuse the refrigerant material as it passes from inside the pressure vessel to outside the container.

4,319,465

CONSTANT VELOCITY JOINT

Akihiko Ito, and Noriaki Saeki, both of Iwata, Japan, assignors to NTN Toyo Bearing Company, Ltd., Osaka, Japan

Filed Nov. 30, 1979, Ser. No. 98,942
Claims priority, application Japan, Dec. 4, 1978, 53-150207
Int. Cl.[3] F16D *3/34*
U.S. Cl. 64—21 **5 Claims**

1. A constant velocity joint comprising an outer joint member having a plurality of axially extending grooves formed in

an inner spherical surface thereof, an inner joint member provided with axially extending grooves in an outer spherical surface thereof in the same number as those in the outer member, a plurality of torque transmitting ball elements accommodated within the respective grooves in the outer and inner members, and a cage member guided between the spherical surfaces of the outer and inner members for holding the torque transmitting ball elements in position, wherein said ball receiving grooves which cooperate with each other on the cooperating outer and inner members for keeping the ball elements in a plane bisecting an angle formed between the axes of the outer and inner joint members, gradually deepen in longitudinal direction thereof, and wherein each groove of at least one of said inner joint member and outer joint member comprises a constant depth portion and relief portions, said constant depth portion having side walls, said relief portions extending radially from said side walls to said spherical surface of said joint member, said relief portions extending circumferentially outwardly of said groove.

4,319,466
SECUREMENT OF LEAF SPRINGS IN TORSIONALLY ELASTIC COUPLING

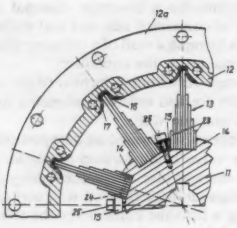
Wolfgang Zaiser, Steinheim, and Ernst Elsner, Herbrechtingen, both of Fed. Rep. of Germany, assignors to Voith Getriebe KG, Fed. Rep. of Germany

Filed Aug. 24, 1979, Ser. No. 69,372

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1978, 2837395

Int. Cl.³ F16D *3/14*

U.S. Cl. 64—27 L **18 Claims**



1. A torsionally elastic coupling comprising:

an inner coupling part; an outer coupling part outside of and spaced from said inner coupling part;

a plurality of leaf-spring assemblies extending between said inner and said outer coupling parts for elastically connecting those said coupling parts together; said leaf-spring assemblies having opposite sides which face generally toward the adjacent said leaf-spring assembly at each opposite side; each said leaf-spring assembly being comprised of a plurality of leaf-springs extending in the direction between said inner and said outer coupling parts, and said leaf-springs of each said assembly being placed adjacent to each other to define a body of substantially homogeneous flexural stress;

at least one of said leaf-springs of each said assembly movably and continuouslly engaging said outer coupling part and such engagement being adapted to permit that said leaf-spring and the said assembly thereof to flex;

wedge-shaped intermediate pieces positioned between adjacent said leaf-spring assemblies; each said intermediate piece having opposite tapered side walls which face toward and engage the opposite said side walls of the adjacent said leaf-spring assemblies between which said intermediate piece is positioned;

said wedge-shaped intermediate pieces being held to said inner coupling part and said wedge-shaped intermediate pieces also serving as means for fastening said leaf-spring assemblies to said inner coupling part; a first plurality of said wedge-shaped intermediate pieces being separate elements from and being held to said inner coupling part; fastening means for fastening said first plurality of intermediate pieces to said inner coupling part; said fastening means driving said first plurality of intermediate pieces toward said inner coupling part for clamping said leaf spring assemblies between adjacent said intermediate pieces to hold said leaf-spring assemblies to said inner coupling part; a second plurality of said wedge-shaped intermediate pieces being interspersed around said inner coupling part among said first plurality of said intermediate pieces; said second plurality of intermediate pieces being integrally formed with said inner coupling part and projecting toward said outer coupling part from said inner coupling part.

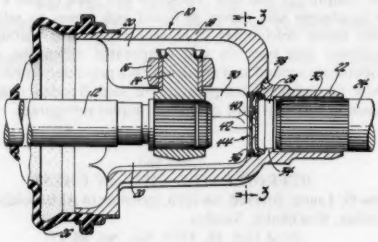
4,319,467
UNIVERSAL JOINT SEAL VENT

Gary G. Hegler, Chesaning, and Kenneth L. Westercamp, Saginaw, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 31, 1980, Ser. No. 135,485

Int. Cl.³ F16D *3/84*

U.S. Cl. 64—32 R **5 Claims**



1. In a universal joint having a housing which includes an attachment bore which opens into a housing chamber via a counterbore at the inner end of the attachment bore and a generally radial vent hole which extends through a wall of the housing, the improvement comprising:

a seal vent subassembly having an outer rim press fitted in the counterbore to form an outer vent chamber which is intersected by the vent hole which extends through the housing wall,

said seal vent having a seal disc which seals an inner end of the attachment bore and a vent disc which forms an inner vent chamber in conjunction with the seal disc,

said vent disc having a hole establishing communication between the housing chamber and the inner vent chamber, and

said rim having a hole or holes establishing communication between said inner vent chamber and said outer vent chamber.

4,319,468
RASCHEL MACHINE

Karl Kohl, Obertshausen, Fed. Rep. of Germany, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Jun. 6, 1980, Ser. No. 157,058

Claims priority, application Switzerland, Jun. 15, 1979, 5612/79

Int. Cl.³ D04B *23/00*

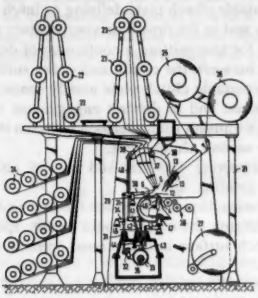
U.S. Cl. 66—203 **10 Claims**

1. A Raschel machine comprising

a plurality of latch needles mounted for reciprocating motion in a given plane;

a plurality of lapping belts spaced from said needles on one said of said plane for guiding pattern yarns to said needles;

a yarn laying-in comb mounted on said one side of said plane for orbital motion perpendicularly of said plane to penetrate between the pattern yarns; and



a plurality of guide bars having needle guides thereon for laying-in stitch yarns, said guide bars being mounted on an opposite side of said plane to oscillate at an angle to the pattern yarns.

4,319,469

PATTERN MECHANISM FOR A WARP KNITTING MACHINE

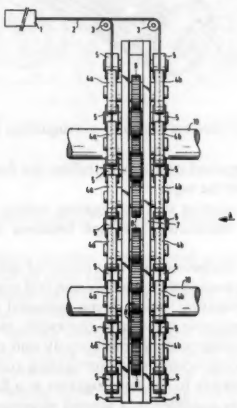
Rudolf Lehn, Bülach, and Otto Hintsch, Wallisellen, both of Switzerland, assignors to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Jun. 10, 1980, Ser. No. 158,308

Claims priority, application Switzerland, Jun. 19, 1979, 5707/79

Int. Cl.³ D04B *23/00*

U.S. Cl. 66—207 **7 Claims**



1. A pattern mechanism for at least a pair of guide bars of a warp knitting machine, said mechanism comprising:

a pair of tension elements, each said element being secured at one end to a respective guide bar;

an elongated carrier member extending between said tension elements;

a pair of rows of final control elements mounted on and along opposite sides of said carrier member to define pairs of interconnected final control elements; and

a common drive connected to at least two pairs of interconnected control elements.

4,319,470

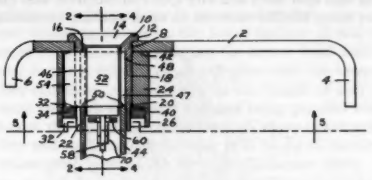
LEVER TYPE DOOR HANDLE

William P. White, c/o Mechanical Applications, Inc., Wiscasset, Me. 04578

Filed Feb. 13, 1980, Ser. No. 121,009

Int. Cl.³ E05B *1/00, 3/00, 3/04, 13/10*

U.S. Cl. 70—224 **1 Claim**



1. A door handle assembly comprising an elongated metal handle having a circular opening therethrough intermediate the ends thereof,

said handle being of substantially uniform thickness and strong enough to meet the loads imposed thereon in the opening and closing of a door to which said assembly may be affixed,

a tubular thimble positioned in said opening,

said thimble having a circular flange at one end which flange overlies and engages the periphery of said opening on one side of said handle to limit movement of said thimble through said opening,

a hub surrounding the extended part of said thimble on the other side of said handle,

said hub comprising a short thick walled cylindrical element of greater outside diameter than the width of said handle at the location of said opening,

said hub having diametrically opposed extensions that straddle and engage the opposite sides of said handle at the position of said opening to prevent relative rotation between said handle and hub,

a longitudinal slot in that part of said thimble on the said other side of said handle and an interior longitudinal keyway in said hub aligned with said slot,

a cylinder within and coaxially aligned with said thimble,

a key extending radially from said cylinder and positioned in said thimble slot and keyway whereby relative angular movement of said cylinder, thimble and hub is prevented,

a ring nut threaded on said thimble and adapted when screwed in the direction of said handle to press in an axial direction against said hub whereby said handle will be clamped between the said flange on said thimble and said hub,

the outside diameter of said cylinder and the inside diameter of said thimble providing a cylindrical space interrupted by said key, said space adapted to receive the end of a slotted lock spindle.

4,319,471

APPARATUS FOR PRODUCING A CORRUGATED TUBE

Hubertus Benteler, Bielefeld; Rainer Hansen; Egon Olszewski, both of Paderborn-Elsen, and Ferdinand Wecker, Paderborn-Sennelager, all of Fed. Rep. of Germany, assignors to Benteler-Werke AG, Paderborn, Fed. Rep. of Germany

Filed Jun. 20, 1980, Ser. No. 162,041

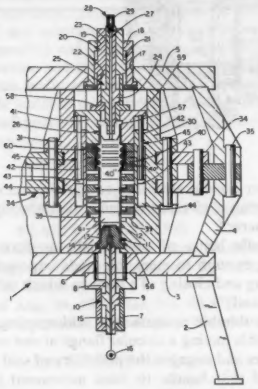
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1980, 3004838

Int. Cl.³ B21D *15/06*

U.S. Cl. 72—59 **14 Claims**

1. Apparatus for producing a corrugated tube from a smooth walled starting tube, comprising support means; a pair of coaxial receiving mandrels axially spaced from each other and movable in axial direction toward each other; means mounted

on said support means for moving said mandrels toward each other to tightly engage into opposite end portions of a starting tube placed axially aligned with said mandrels on said support means; a plurality of split corrugation forming discs superimposed and axially spaced from each other; a split end member arranged at one end of said superimposed discs; means connecting said discs and said end member for axial movement relative to each other; a pair of clamping jaws respectively carrying said split discs and said split end member, said clamping jaws being tiltable between an open position permitting to



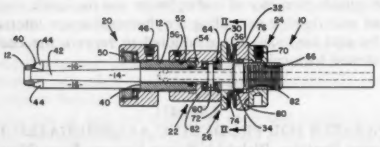
align a starting tube with said mandrels and a closed position fluid tightly clamping one end portion of the starting tube between one of said mandrels and the closed end member and the other end portion of the starting tube between the other mandrel and said clamping jaws; means for feeding a pressure fluid into the interior of the starting tube and for discharging such pressure fluid from the finished corrugated tube; and offsetting means cooperating with said end member for moving the latter together with said one mandrel in axial direction toward the other mandrel to transform the starting tube into a corrugated tube.

4,319,472

TUBE END EXPANDER AND METHOD OF OPERATING THE SAME

Gregory W. Martin, Williamsville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 7, 1980, Ser. No. 128,328
Int. Cl.[3] B21D *39/06*
U.S. Cl. 72—122 **7 Claims**



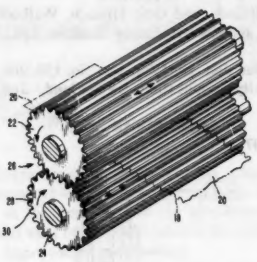
1. A tube end expander comprising:
- a rotatable, tubular cage defining a plurality of generally axially extending slots;
- a plurality of rollers located within the cage and extending through the slots;
- a rotatable, tapered mandrel axially extending into the cage in frictional, driving contact with inner surfaces of the rollers; and
- auxiliary drive means for transmitting rotary motion from the mandrel to the cage and rollers, and including
- collar means defining a collar surface and including a front collar connected to the cage for rotation therewith, and a back collar connected to the mandrel for rotation therewith, and
- a clutch member for transmitting rotary motion from the back collar to the front collar and including
- a first rotatable clutch plate defining a clutch surface contiguous to and in frictional, driving contact with the collar surface for transmitting a continuum of degrees of rotary motion between the clutch and collar surfaces,
- a second rotatable clutch plate axially spaced from the first clutch plate and in driving engagement with the collar means to transmit rotary motion between the collar means and the second clutch plate,
- means connecting the first and second clutch plates for unitary rotation, and
- resilient means disposed between the first and second clutch plates, urging the clutch plates axially apart, and urging the clutch surface into frictional contact with the collar surface.

4,319,473

APPARATUS FOR CORRUGATING A METAL TAPE

Edward L. Franke, Jr., Perry Hall; George E. Hartranft, Baltimore County, and Amrutlal D. Patel, Annapolis, all of Md., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 28, 1979, Ser. No. 70,385
Int. Cl.[3] B21B *31/18;* **B21D** *13/04*
U.S. Cl. 72—196 **9 Claims**



1. An apparatus for forming corrugations in a tape, which comprises:
- a pair of opposed corrugating rollers for forming the corrugations in the tape;
- means for rotating said corrugating rollers;
- means for advancing the tape between said corrugating rollers;
- a carriage reciprocable transversely of and relative to the path of travel of the tape between said corrugating rollers, said corrugating rollers being mounted on said carriage for reciprocable movement therewith; and
- means for reciprocating continuously said carriage to reciprocate continuously said corrugating rollers transversely of and relative to the tape together in a first direction and alternately together in a second direction reverse of the first direction as the tape advances between said corrugating rollers.

4,319,474

ROLLING METHOD AND APPARATUS

Robert W. Gronbech, Sheffield, England, assignor to Davy-Loewy Limited, Yorkshire, England

Filed Mar. 10, 1980, Ser. No. 128,902
Int. Cl.[3] B21B *41/06*
U.S. Cl. 72—229 **11 Claims**

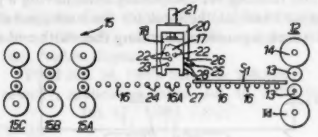
1. In a method of hot rolling a metal workpiece in a revers-

ing roughing mill followed by a continuous finishing mill with a coiler between those mills, the steps of

(a) rolling said workpiece in said roughing mill in a series of passes to a gauge for entry to said finishing mill;

(b) prior to the penultimate forward pass, bringing said coiler into an inoperative condition in which said workpiece can pass the coiler location without obstruction;

(c) in the penultimate forward pass rolling said workpiece in



said roughing mill to a length exceeding the spacing of said coiler from said roughing mill but less than the spacing of said finishing mill from said roughing mill;

(d) after said workpiece has been reversed towards said roughing mill to clear said coiler position, bringing said coiler into an operative condition for coiling;

(e) in the last forward pass coiling said workpiece by said coiler; and

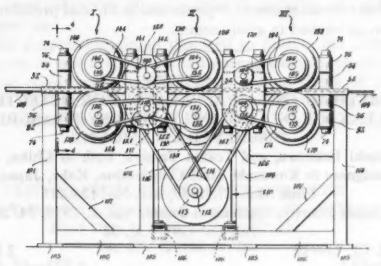
(f) then uncoiling said workpiece to said finishing mill.

4,319,475

CENTER-SPINE MOUNTED TANDEM CANTILEVERED ROLLING MILL

Allan Stikeleather, 25 Greenlodge St., Canton, Mass. 02021

Filed Jun. 13, 1980, Ser. No. 159,135
Int. Cl.³ B21B *31/02*
U.S. Cl. 72—234 **8 Claims**



1. A center-spine mounted cantilever tandem rolling mill comprising:

at least three upper spindles each adapted to carry an upper work roll near its front end,

at least three lower spindles each adapted to carry a lower work roll near its front end,

an upper front bearing surrounding each upper spindle and an upper rear bearing surrounding each upper spindle, with each upper front bearing being positioned on its spindle between the upper rear bearing and the location of the upper work roll on the spindle for rotatably holding the respective upper spindles with the work rolls being in cantilevered relationship beyond the respective upper front bearings,

a lower front bearing surrounding each lower spindle and a lower rear bearing surrounding each lower spindle with each lower front bearing being positioned on its spindle between the lower rear bearing and the location of the lower work roll on the spindle for rotatably holding the respective lower spindles with the work rolls being in cantilevered relationship beyond the respective lower front bearings,

an elongated rigid center spine extending horizontally midway between the upper and lower spindles,

a support frame for supporting said center spine extending horizontally above the floor,

upper mounting means on the upper surface of said center spine for removably securing the upper front and upper rear bearings above said center spine with the upper spindles extending perpendicular to the length of said center spine and with the upper work rolls being in cantilevered relationship beyond the front of said center spine,

lower mounting means on the lower surface of said center spine for removably securing the lower front and lower rear bearings below said center spine with the lower spindles extending perpendicular to the length of said center spine and with the lower spindles being parallel with and below the upper spindles in paired upper-lower relationship and with the lower work rolls being in cantilevered relationship beyond the front of said center spine,

drive means mounted on said frame and connected to all of said spindles for simultaneously driving all of said spindles in tandem relationship,

whereby any one of said upper spindles or lower spindles can be individually removed from said center spine without removing any other spindle, and

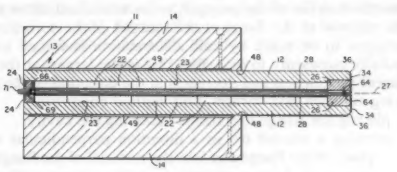
whereby said center spine positioned midway between the upper and lower spindles isolates the respective spindles from rolling stresses occurring in neighboring spindles.

4,319,476

METHODS AND APPARATUS FOR EXTRUSION

Francis J. Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Jul. 19, 1978, Ser. No. 926,164
Int. Cl.³ B21C *23/32, 27/00, 33/00*
U.S. Cl. 72—272 **36 Claims**



1. A method of extruding an elongated workpiece to form an elongated product, comprising the steps of:

(a) so operatively engaging a plurality of gripping members with the elongated workpiece, in a retracted position of the plurality of gripping members, that at least a portion of the plurality of gripping members approach each other and effectively contact at least a substantial length of the elongated workpiece while causing a chamber to be formed thereabout;

(b) reciprocating the plurality of gripping members relative to an extrusion station, first away from said retracted position of the plurality of gripping members and in the direction of the extrusion station to an extent sufficient to advance at least a portion of said chamber about and past an aperture through a die at the extrusion station, thereby forcing at least a portion of the elongated workpiece through the die aperture and at least partly forming said elongated product, and then away from the extrusion station and again into said retracted position of the plurality of gripping members so as to withdraw the chamber from the extrusion station; and

(c) urging towards each other at least a portion of said gripping members in the course of their reciprocation towards said station by pressure produced by pressure exerting means so as to be manifested in and restricted to, a region defined by such means which is positionally fixed relative to said die aperture and extends rearwardly therefrom for less than the length of said members, such urging converting such pro-

duced pressure into inward pressure applied in said fixed region by at least such portion of such members on said workpiece for forcing such workpiece through said die aperture.

4,319,477

METHOD AND TOOL FOR PRODUCING A BUSHING STRUCTURE HAVING A POLYGONAL FLANGE

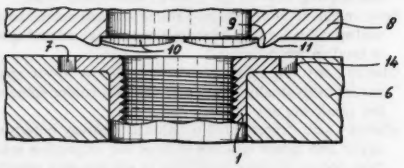
Frans A. W. Tasseron, Heemstede, Netherlands, assignor to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed Jan. 25, 1980, Ser. No. 115,363

Claims priority, application Netherlands, Jan. 29, 1979, 7900689

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—352 **3 Claims**



1. A method for producing a bushing structure having a screw thread and a polygonal flange out of a sheet metal blank primarily by forming the bush portion out of the sheet metal blank and thereafter shaping the remaining portion of the plate which portion has become the flange of the bush portion, into the proper polygonal shape, the bushing structure with flange being manufactured from a sheet metal blank of dimensions such that after forming the bush portion the flange has an outer diameter which in principle is equal to the diameter of the inscribed circle of the polygon to be made and subsequently the material of the flange at the location of the corners of the polygon to be made by cold deformation is forced to flow radially outwardly to an extent that is the largest at the location of the corners and decreases in the direction of the points lying between said corners, said method comprising:

placing the flange in a flange receiving die cavity;

pressing a second die in a direction perpendicular to the plane of the flange and into the material of the flange, said second die having projections with an inner surface substantially parallel to the axis of the bushing and having a bottom surface running obliquely and archingly upwards and outwards, the radial width of said projections decreasing from the center to both sides thereof, said projections having a volume which in principle corresponds to the volume of material of the flange that has to be displaced to form the corners.

4,319,478

METHOD FOR MANUFACTURING AN INNER JOINT MEMBER OF CONSTANT VELOCITY JOINT

Morihisa Yoshioka, Hamamatsu, Japan, assignor to NTN Toyo Bearing Company, Ltd., Osaka, Japan

PCT No. PCT/JP79/00304, § 371 Date Aug. 2, 1980, § 102(e) Date May 23, 1980, PCT Pub. No. WO80/01145, PCT Pub. Date Jun. 12, 1980.

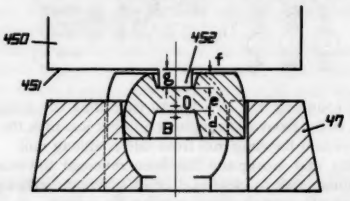
PCT Filed Nov. 29, 1979, Ser. No. 202,437

Claims priority, application Japan, Dec. 2, 1978, 53-149467

Int. Cl.³ B21D *72/00*

U.S. Cl. 72—306 **4 Claims**

1. A method for manufacturing an inner joint member of constant velocity joint having an outer spherical surface and provided at circumferentially distributed positions in the outer spherical surface with ball grooves each having arcuate groove bottom as viewed in axial section with the curvature center of the arcuate groove bottom being axially apart from the curvature center of the outer spherical surface, characterized in consisting of the steps of first plastic working a stock for the inner joint member on a first forming set so as to provide an outer periphery and ball grooves shaped as arcs whose curvature centers are respectively located at predetermined points as viewed in axial section with respect to substantially a half of the length of the inner joint member, said outer periphery and said ball grooves being shaped as straight lines respectively connecting with the arcs and parallel to the longitudinal axis of the inner joint member with respect to substantially the other half, said first forming set comprising a die having a predetermined contour to which the stock for the inner joint member is to be conformed, a punch cooperating therewith and a counter



punch, said punch and said counter punch being so designed that in the first plastic working step, axially extending recesses are formed at the central portions in the both end surfaces of the half-shaped article obtained by the first step, one of which recesses on the straight-shaped-portion side of the article being equal to or greater in depth than the length of the straight-shaped-portion, and thereafter plastic working the half-shaped article on a second forming set comprising a die having a predetermined contour to which the article obtained by the first step is to be conformed and a cooperating punch so as to shape the straight-shaped portions of said ball grooves as arcs whose curvature center is positioned at the said predetermined point as viewed in axial section.

4,319,479

METHOD AND AN APPARATUS FOR DETECTING LEAKAGE OF COOLING WATER BY MEASURING DISSOLVED CO AMOUNT

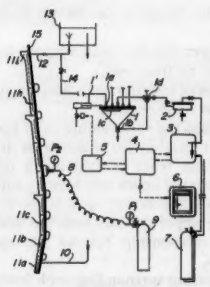
Tadaaki Iwamura, and Toshio Tamiya, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Mar. 27, 1980, Ser. No. 134,697

Claims priority, application Japan, Apr. 2, 1979, 54/39523

Int. Cl.³ G01N *31/08*

U.S. Cl. 73—19 **2 Claims**



1. A method for detecting leakage of cooling water in equipment keeping a large amount of CO gas therein, which method comprises, taking up part of the cooling water discharged by said equipment as sample water, feeding the sample water into a metering tube for separating a predetermined amount of water thereof, feeding the metered sample water into a degas-

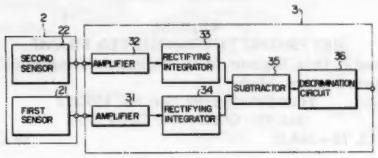
sing chamber to separate CO gas and CO_2 gas dissolved therein, from water, quantitatively analyzing the CO gas by means of a gas chromatograph to record the measured CO amount, and inspecting the variation of the amount of CO gas dissolved in the discharged cooling water.

4,319,480

KNOCK DETECTOR DEVICE FOR INTERNAL COMBUSTION ENGINES

Hiroaki Yamaguchi, Anjo; Tadashi Hattori, and Yoshinori Ootsuka, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 14, 1980, Ser. No. 168,166
Claims priority, application Japan, Jul. 16, 1979, 54-90859
Int. Cl.³ G01L *23/22*
U.S. Cl. 73—35 **9 Claims**



1. A knock detector device for internal combustion engines comprising:

first sensing means having at least one resonance characteristic within a knocking frequency range of an engine and disposed to sense vibrations of said engine to generate an output signal;

second sensing means having no resonance characteristic within said engine knocking frequency range and disposed to sense vibrations of said engine to generate an output signal; and

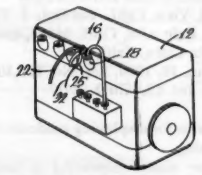
a noise suppressing circuit disposed to receive the output signals of said first and second sensing means such that a noise component contained in the output signal of said first sensing means is eliminated by the output signal of said second sensing means.

4,319,481

CLIP-ON PIEZOELECTRIC TRANSDUCER

Edward Yelke, 945 S. Kensington, La Grange, Ill. 60525

Filed Dec. 3, 1979, Ser. No. 99,527
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—119 A **3 Claims**



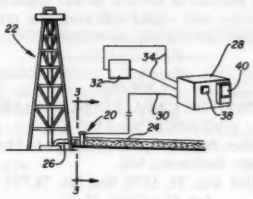
1. A transducer for removably mounting onto the fluid injection line members coupling to a fluid injection nozzle assembly which controls the injection of fluid to an injection type engine, said transducer comprising in combination, a relatively rigid mounting means having an opening thereon for clipping onto a fluid injection line member, piezoelectric material positioned on a surface of said mounting means for positioning in engagement with said line member and being operable to generate an electrical signal dependent on vibration of said line member, and an electric connector connecting said piezoelectric material to associated electronic circuitry.

4,319,482

GAS SENSOR

Thomas A. Bunner, Abilene, Tex., assignor to FerreTronics, Inc., Abilene, Tex.

Filed Mar. 10, 1980, Ser. No. 128,886
Int. Cl.³ E21B *47/00*
U.S. Cl. 73—153 **15 Claims**



13. In an oil or gas drilling operation, a method for detecting hydrocarbon gases released from drilling mud used in the drilling operation, comprising:

receiving the drilling mud from the mouth of the well through a housing,

positioning a hydrocarbon semiconductor detector in the housing above the flow of mud therethrough to produce a signal in response to the presence of hydrocarbon gas, and

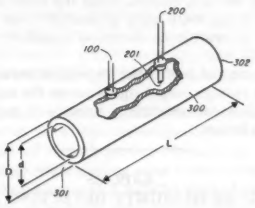
transmitting the signal from the detector to a remote recorder.

4,319,483

METHOD OF AUTOMATED FLUID FLOW MEASUREMENT

Kenneth M. Durham, Jr.; Roy W. Tarpley, both of Garland, and Larry A. Rehn, Rowlett, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 25, 1980, Ser. No. 124,419
Int. Cl.³ G01F *1/68*
U.S. Cl. 73—204 **5 Claims**



1. An automated fluid flow measurement system comprising:

a first silicon resistor disposed in a position having a fluid flow therepast having an impurity concentration for causing a positive temperature coefficient of resistance and having a first predetermined resistance at a reference temperature;

a second silicon resistor disposed in a position exposed to the same temperature as the temperature of the fluid flowing past said first silicon resistance element having an impurity concentration equal to the impurity concentration of said first silicon resistor and having a second predetermined resistance at said reference temperature, said second predetermined resistance being greater than said first predetermined resistance;

a temperature measurement means connected to said second silicon resistor for measuring the electrical resistance of said second silicon resistor thereby providing a measure of the temperature of the fluid; and

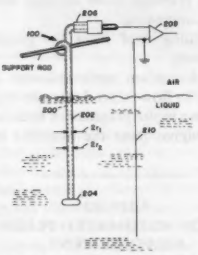
a flow measurement means connected to said first silicon resistor and said temperature measurement means for measuring the electrical resistance of said first silicon resistor thereby providing a measure of the temperature of said first silicon resistors for applying electrical power to said first silicon resistor to heat said first silicon resistor to a temperature a predetermined amount higher than the temperature of the fluid and for generating a signal indicative of the amount of electric power applied to said first silicon resistor, said signal indicating the rate of flow of the fluid past said first silicon resistor.

4,319,484

LINEAR RESPONSE CAPACITANCE WAVE HEIGHT MEASURING SYSTEM

Christian A. Keller, Baltimore, Md., assignor to The Johns-Hopkins University, Baltimore, Md.

Filed Aug. 31, 1979, Ser. No. 71,704
Int. Cl.³ G01F *23/26*
U.S. Cl. 73—304 C **14 Claims**



1. Apparatus for measuring the level of a fluid comprising:
capacitive means C_X comprised of two stationary electrically conductive elements partially immersed in the fluid and a dielectric which surrounds and insulates the first element, the first element having sealing means for electrically isolating the first element from the fluid and the second element being electrically grounded to the fluid,
means for providing an electrical signal to the capacitive means C_X, and
means, connected across the capacitive means C_X, for providing a voltage output signal across the capacitive means C_X which varies essentially linearly in response to fluid level variations.

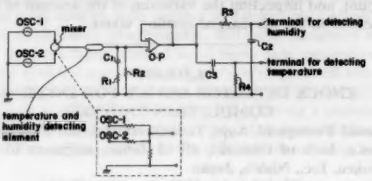
4,319,485

TEMPERATURE-HUMIDITY DETECTING APPARATUS

Jiro Terada, and Tsuneharu Nitta, both of Katano, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 26, 1979, Ser. No. 107,183
Claims priority, application Japan, Dec. 28, 1978, 53-163478; Dec. 28, 1978, 53-163479; Jun. 9, 1979, 54-72548; Jun. 9, 1979, 54-72549; Jun. 9, 1979, 54-72550; Jun. 9, 1979, 54-72558
Int. Cl.³ G01W *27/02*
U.S. Cl. 73—336 **4 Claims**

1. A temperature-humidity detecting apparatus comprising:
an element in which a pair of electrodes having terminals are provided on a dielectric portion, said dielectric varying in impedance in accordance with variations in the ambient temperature and humidity due to the large temperature dependency of the dielectric constant thereof and the large variation in resistance value due to the vapor absorption thereof;
a load impedance whose impedance selectively varies in accordance with variations in frequency; and
an oscillating circuit power source, said load impedance and said oscillating circuit power source being connected in series with said electrode terminals of said element, the temperature and humidity being detected by selecting



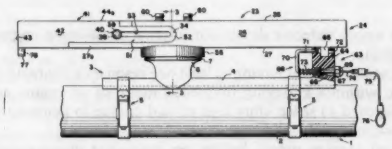
respective oscillating frequencies of said oscillating circuit power source.

4,319,486

REVERSING THERMOMETER FRAME

Edmund P. Deja, Saginaw, Mich., assignor to Trippensee Corporation, Saginaw, Mich.

Filed Feb. 7, 1980, Ser. No. 119,222
Int. Cl.³ G01K *1/14*; G01N *1/10*
U.S. Cl. 73—343 B **19 Claims**



1. In a reversing thermometer frame having a base member, a body member having a chamber therein open at one end for accommodating at least one thermometer, means rotatably coupling said body to said base, means biasing said body to rotate in one direction relative to said base from a first position to a second position, and means for releasably latching said body in said first position, the improvement comprising a closure at said one end of said body for selectively opening and closing said one end of said chamber; means mounting said closure on said body for sequential and rotary movements relative thereto between chamber opening and chamber-closing positions; and means for releasably retaining said closure in its chamber-closing position.

4,319,487

BARO DATA INDICATOR

Wayne C. Haase, Mt. View, Calif., and Dale J. Thompson, 1900 Embarcadero Rd., Palo Alto, Calif. 94303, assignors to Dale J. Thompson, Santa Clara, Calif.

Filed Jan. 25, 1980, Ser. No. 115,507
Int. Cl.³ G01L *7/00*
U.S. Cl. 73—384 **9 Claims**

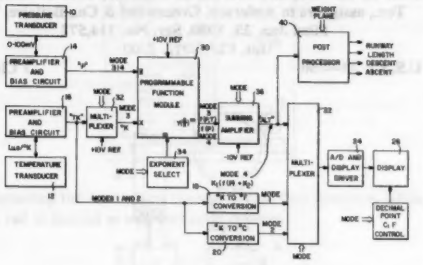
6. Avionics apparatus for displaying readouts of temperature and altitude comprising
pressure transducer means responsive to ambient pressure and generating a pressure electrical signal,
temperature transducer means responsive to ambient temperature and generating a temperature electrical signal,
first preamplifier and bias circuitry for receiving said pressure electrical signal and generating an adjusted pressure electrical signal,
second preamplifier and bias circuitry for receiving said temperature electrical signal and generating an adjusted temperature electrical signal,
conversion means for receiving said adjusted temperature electrical signal and generating a converted temperature electrical signal,

mode selection means for selecting a mode of operation of said avionics apparatus,

a function module means,

means responsive to said mode selection means for applying said adjusted temperature electrical signal and said adjusted pressure electrical signal to said function module means,

said function module means being responsive to said mode selection means and generating a first electrical signal as a function of said adjusted pressure signal and generating a



second electrical signal as a function of said adjusted temperature electrical signal and of said adjusted pressure electrical signal,

multiplexer means,

means for applying said converted temperature electrical signal, said first electrical signal, and said second electrical signal to said multiplexer means,

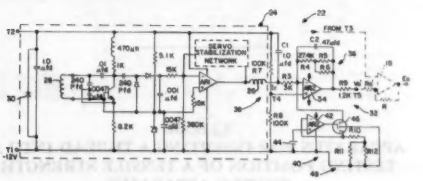
display means,

and means connecting said multiplexer to said display means whereby said display means selectively displays temperature and altitude in response to said mode selection means.

4,319,488
ACCELEROMETER

Larry P. Hobbs, Brentwood; Harold D. Morris, Orinda, and Scott F. Voelker, Concord, all of Calif., assignors to Systron-Donner, Concord, Calif.

Filed Aug. 1, 1980, Ser. No. 174,687
Int. Cl.[3] G01P *15/08*
U.S. Cl. 73—509 **9 Claims**



1. An accelerometer comprising:

(a) means for supplying an excitation voltage;

(b) means operating on said excitation voltage for sensing acceleration and producing a first signal which corresponds to the acceleration sensed but which is independent of said excitation voltage;

(c) means connected with said voltage supplying means for producing a second signal corresponding to a fixed proportion of said excitation voltage;

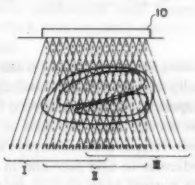
(d) means connected with said first and second signal producing means for combining said first and second signals and producing a third signal corresponding thereto, said third signal being dependent on the acceleration sensed and said excitation voltage whereby fluctuations in the latter will cause fluctuations in said third signal; and

(e) means connected with said second and third signal producing means for subtracting said second signal from said third signal and producing an output signal dependent on the acceleration sensed and independent of said excitation voltage.

4,319,489
ULTRASONIC DIAGNOSTIC METHOD AND APPARATUS

Keiki Yamaguchi; Yasuhito Takeuchi; Toru Shimazaki, and Naoki Seki, all of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Mar. 28, 1980, Ser. No. 135,157
Int. Cl.[3] G01N *29/00*
U.S. Cl. 73—626 **7 Claims**



1. In an ultrasonic diagnostic apparatus for diagnosing the internal condition of an object medium by projecting an ultrasonic beam thereto from a vibrator array having a plurality of ultrasonic vibrators, the invention comprising:

a matrix switching circuit having vertical leadwires connected to each of said plurality of ultrasonic vibrators,

delay circuit means having a plurality of individually different delays,

horizontal leadwires intersecting said vertical leadwires forming a matrix, said horizontal leadwires being connected to different delays in said delay circuit means,

switch control means coupled to said matrix switch circuit for sequentially connecting the intersections of said vertical and horizontal leadwires during leftward inclined and/or rightward inclining linear scanning of said vibrator array,

means including said switch control means for scanning said vibrator array in a leftward-inclined linear scan which drives some of the ultrasonic vibrators at individually different times while shifting some of the vibrators sequentially to cause a sequential parallel shift of the ultrasonic beam having an angle of leftward-inclination against said vibratory array, and for scanning said vibrator array in a rightward-inclined linear scan which drives some of the ultrasonic vibrators at individually different times while sequentially shifting some of the vibrators to cause a sequential parallel shift of the ultrasonic beam having an angle of rightward-inclination against said vibrator array,

means for scanning said vibrator array in a linear scan which drives some of the ultrasonic vibrators simultaneously with shifting some of the vibrators sequentially to cause a sequential parallel shift of the ultrasonic beam which is substantially perpendicular to said vibrator array,

said ultrasonic vibrators which are driven at different times in said leftward-inclined linear scan and said rightward inclined linear scan being alternated between m (m=an integer) and (m+1) vibrators for finely shifting said ultrasonic beams, and

means for combining the images obtained through two or more scans of said object medium to form a composite image thereof.

4,319,490

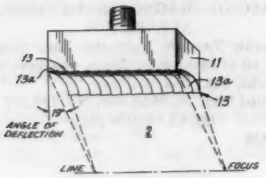
MULTIPLE WEDGE ELEMENT LENS FOR AN ULTRASONIC INSPECTION TRANSDUCER

Henry Hartmann, Jr., Passaic County, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 3, 1980, Ser. No. 126,804

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—642 **12 Claims**



1. An improved lens for an ultrasonic transducer comprising a flat or cylindrically concave face including multiple wedge shaped elements superimposed on said face forming said lens, wherein said elements are each inclined at a uniform angle from said face so asto refract ultrasonic rays at a uniform angle from a line perpendicular to said face and in a parallel pattern in a plane which is normal both to said face and said wedge shaped elements.

4,319,491

METHOD AND APPARATUS FOR DETERMINING AT LEAST ONE COMPONENT OF A SAMPLE OF GRAIN, SEED, OR ANOTHER PARTICULATE MATERIAL

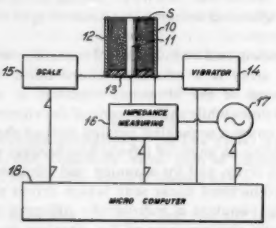
Sten R. Christoffersen, Hillerod; Johan C. Gregersen, Soborg, and Mogens B. Larsen, Helsinge, all of Denmark, assignors to A/S N. Foss Electric, Hillerod, Denmark

Filed Jun. 8, 1979, Ser. No. 46,709

Claims priority, application Denmark, Jun. 9, 1978, 2599/78; France, Dec. 27, 1978, 78 36446

Int. Cl.³ G01R *27/26*

U.S. Cl. 73—662 **2 Claims**



1. A method of determining at least one component of a sample of a particulate material, such as grain or seed, said method comprising:

introducing said sample in a movably mounted container,

compacting said sample in said container to a predetermined degree by vibrating said container during the filling thereof with said sample,

exposing said compacted sample in said container to an alternating electric field,

measuring a permittivity value of said compacted sample,

determining said component on the basis of said permittivity value, and

determining the weight of the sample based on the natural vibrational frequency of said movably mounted container with said sample container therein.

4,319,492

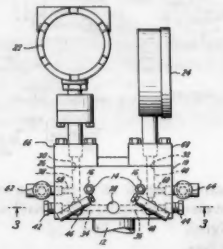
PRESSURE TRANSMITTER MANIFOLD

John E. Hewson, and Marion L. Schomer, both of Houston, Tex., assignors to Anderson, Greenwood & Co., Bellaire, Tex.

Filed Jan. 23, 1980, Ser. No. 114,572

Int. Cl.³ G01L *7/00*

U.S. Cl. 73—756 **7 Claims**



5. Apparatus for mounting a pressure transmitter comprising

a manifold block having an inlet, a pair of outlets, passage means through said block connecting the inlet to the outlets, and means for isolating each outlet individually from the inlet,

said inlet supplying a common pressure to both of said outlets,

means for supporting said manifold block in a preselected position,

a pressure transmitter connected into one of said outlets,

a first connection into said passage means through said block, connecting at a point between said inlet and one of said isolating means, and

a pressure switch connected to said first connection to provide shut-down if pressures at said inlet exceed preselected limits.

4,319,493

APPARATUS FOR INSERTING A THREAD INTO A TESTING POSITION OF A TENSILE STRENGTH TESTING APPARATUS

Gerold Roos, Esslingen, Switzerland, assignor to Zellweger, Ltd., Esslingen, Switzerland

Filed Jul. 9, 1980, Ser. No. 167,027

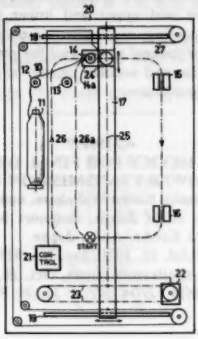
Claims priority, application Switzerland, Sep. 19, 1979, 8441/79

Int. Cl.³ G01N *3/08*

U.S. Cl. 73—828 **8 Claims**

1. An apparatus for inserting a thread into the testing position of a tensile strength testing apparatus, in which at least one thread is maintained in a ready position in a clamping device for insertion, the said apparatus comprising an insertion clamp; means including a rail for mounting said insertion clamp for movement oriented in a first direction along said rail in the vicinity of the tensile strength testing apparatus; means for

moving said rail in a second direction orthogonal to said first direction; and traveling guide means connected to said rail for



maintaining the orientation thereof in said first direction while said rail is moved in said second direction.

4,319,494

RETORQUE MEASURING APPARATUS

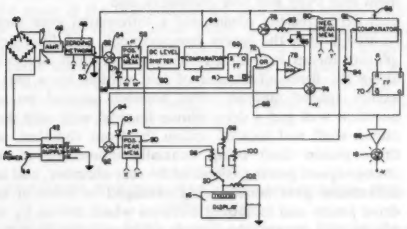
Eugene J. Marcinkiewicz, Plymouth, Mich., assignor to GSE, Inc., Farmington Hills, Mich.

Continuation-in-part of Ser. No. 20,610, Mar. 15, 1979, Pat. No. 4,244,213. This application Dec. 17, 1980, Ser. No. 217,481

The portion of the term of this patent subsequent to Jan. 13, 1998, has been disclaimed.

Int. Cl.[3] B25B *23/142*; G01L *5/24*

U.S. Cl. 73—862.23 **5 Claims**



1. Apparatus for measuring the amount of previously applied torque to a fastener comprising:

transducer means providing an output signal representative of the amount of subsequently applied torque to the fastener, such torque being applied until motion of the fastener is obtained,

detector means for detecting a change of slope in said transducer signal above a given threshold level, operative to provide an output related to the applied torque when the change of slope is detected; and

display means for displaying the output of said detector means, said output being closely associated with the amount of torque originally applied to the fastener.

4,319,495

COUPLING AND UNCOUPLING APPARATUS

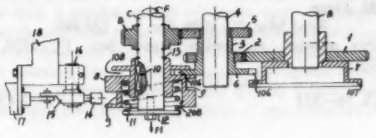
Sandro Salicini, Bologna, Italy, assignor to Carle & Montanari S.p.A., Bologna, Italy

Filed Apr. 18, 1980, Ser. No. 141,680

Claims priority, application Italy, Apr. 27, 1979, 12568 A/79

Int. Cl.[3] F16H *57/00*; F16D *11/06*

U.S. Cl. 74—405 **13 Claims**



2. Apparatus for controlling in phase coupling and uncoupling of a kinematic mechanism with respect to another such mechanism to which intermittent rotary movement is imparted, comprising:

a driving member including a driving shaft, to which intermittent rotary movement is imparted;

a driven member including a shaft, said driven member being controlled for selective in phase movement relative to said driving member, said driving and driven shafts being substantially parallel to each other; and

control means for operatively interconnecting the driving member and driven member, said control means being movable between first and second positions, whereby intermittent rotary movement of the driving member is transmitted through the control means to the driven member in the first position, said driven member being maintained stationary in said second position, said control means carried on a shaft substantially parallel to said driving and driven shafts,

whereby said control means maintains in phase relationship between the driven member and the driving member when the control means moves from first position to second position, thereby enabling the driven member to have the same phase relative to the driving member when said control means returns to the first position and intermittent rotary movement of the driven member is recommenced.

4,319,496

FORK ROD SLIDABLY SUPPORTING DEVICE FOR TRANSFER OF VEHICLES

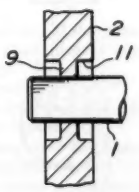
Norihide Yanaga, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 21, 1979, Ser. No. 106,245

Claims priority, application Japan, Jan. 8, 1979, 54-87[U]

Int. Cl.[3] G05G *9/12*; F16C *29/02*

U.S. Cl. 74—473 R **11 Claims**



1. In a device for slidably supporting a fork rod in a manually operable transmission wherein the fork rod is slidably supported at both its ends by supporting holes provided in transmission case walls, the improvement comprising a ridge-shaped portion interposed between said fork rod and said

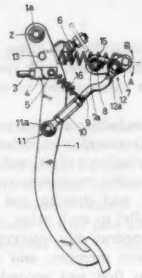
supporting holes, said ridge-shaped portion having a width which is smaller than that of said transmission case wall in the axial direction of said fork rod.

4,319,497

DEVICE FOR TURNING OVER A CLUTCH PEDAL

Hiroaki Shinto, Toyota, and Shigemichi Yamada, Aichi, both of Japan, assignors to Toyota Jidosha Kogya Kabushiki Kaisha, Aichi, Japan

Filed Mar. 10, 1980, Ser. No. 128,449
Claims priority, application Japan, Sep. 17, 1979, 54-128961[U]
Int. Cl.³ G05G 1/14
U.S. Cl. 74—512 3 Claims



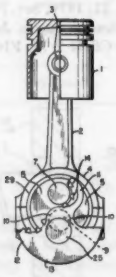
1. A device for turning over a clutch pedal comprising an arm for turning said clutch pedal over, a rod connecting said arm to said clutch pedal for joint rotation upon working of said clutch pedal and a tension spring connected to said arm and said clutch pedal, the direction of force of said tension spring acting on said clutch pedal for returning the same to its initial position being changed to assist forward movement of said clutch pedal upon movement of said clutch pedal to a predetermined position, said device further including a biasing means connected to said rod for applying lateral force thereto.

4,319,498

RECIPROCATING ENGINE

Edward M. McWhorter, 6931 Greenbrook Cir., Citrus Heights, Calif. 95610

Filed Jun. 11, 1979, Ser. No. 47,106
Int. Cl.³ F16F 15/26; F02B 75/32
U.S. Cl. 74—595 11 Claims



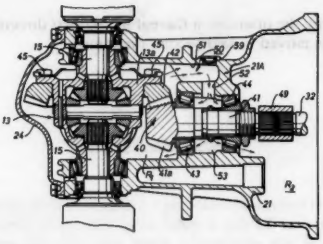
1. A crankshaft comprising a plurality of axially aligned and axially spaced mainshafts, arms fixed on the adjacent ends of said mainshafts, a crankpin joining adjacent said arms forming a crankthrow of a crankshaft having a plurality of such crankthrows, upper and lower transfer bars rigidly attached to each said arm, said transfer bars holding a plurality of rigidly mounted resilient impactors, a transfer disc pivotally mounted on said crankpins, a secondary transfer crankpins fixedly attached to said transfer discs, said secondary transfer crankpins operating between said upper and lower transfer bars and intermittantly contacting said resilient impactors, a connecting rod having a major journal at one end for rotatively mounting on said transfer disc and smaller journal at the other end for pivotally attaching a piston.

4,319,499

LUBRICATING DEVICE FOR FINAL DRIVE GEARING OF POWER TRANSMISSION UNIT

Yoshio Sanui, Okazaki; Kaoru Wakahara, and Yasuyoshi Yasui, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 25, 1978, Ser. No. 927,690
Claims priority, application Japan, Oct. 18, 1977, 52-124898
Int. Cl.³ F16H 57/04, 57/02, 37/08; F01M 1/00
U.S. Cl. 74—700 2 Claims



1. In a power transmission unit for a motor vehicle of the front-engine, front-wheel drive type comprising:

a trans-axle casing for connection at its upright front seating face to a cylinder block of an engine and at its upright rear seating face to a transmission casing for change-speed gearing means, said trans-axle casing having an upper compartment for containing a disengageable coupling for connection to a crankshaft of said engine and a lower compartment, the lower compartment being provided with an upright partition wall to subdivide the compartment into front and rear chambers; and

a final drive gearing means and a differential gear means located within the lower compartment, said final drive gearing means including a drive pinion shaft supported along the fore-and-aft axis of said vehicle by a pair of axially spaced tapered roller bearings carried on said partition wall and a drive pinion integral with said drive pinion shaft and located within the front chamber, said drive pinion shaft being coaxially connected to said change-speed gearing means in the rear chamber, and said differential gear means being arranged in front of said drive pinion and including a crown wheel driven by said pinion, said crown wheel being positioned on one side of the longitudinal axis of said drive pinion shaft;

the improvement wherein said partition wall includes a passage means formed therein on the same side of said drive pinion shaft axis as said crown wheel such that lubricating oil picked up by rotation of said crown wheel is directly supplied via said passage means into an annular space around said drive pinion shaft between said bearings for lubricating said bearings, and wherein said partition wall further includes an aperture, at the bottom portion thereof, interconnecting the front and rear chambers, said aperture being located on the opposite side of said drive pinion shaft axis from said crown wheel to prevent the lubricating oil from directly flowing into the rear chamber from the front chamber during rotation of said crown wheel.

4,319,500

HYDRO-MECHANICAL CHANGE SPEED MECHANISM

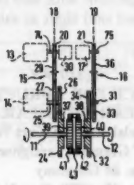
Josef Horn, Wernau, Fed. Rep. of Germany, assignor to Kibo Kommunalmaschinen GmbH & Co. KG, Hohenbrunn, Fed. Rep. of Germany

Filed Jan. 9, 1980, Ser. No. 110,630

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1979, 2900776

Int. Cl.³ F16H *47/00, 47/02*

U.S. Cl. 74—720 32 Claims



1. A hydro-mechanical change speed mechanism in particular for a vehicle driving an associated apparatus whilst travelling at a relatively reduced speed, such as a road sweeping vehicle, the mechanism featuring an input shaft drivable from the vehicle motor via a mechanical vehicle drive, an output shaft which is adapted to drive the vehicle wheels, said output shaft being axially aligned with said input shaft, means actuated by a driver controlled selector mechanism for selectively coupling in direct drive said output shaft to, or decoupling said output shaft from, said input shaft, a first gear train comprised only of gears with axes lying parallel to said input shaft and generally in a plane at right angles to said input shaft, said first gear train being connectable with said input shaft when the output shaft is decoupled and being in driving arrangement with a vehicle drive pump and the associated apparatus and a second gear train comprised only of gears with their axes lying parallel to the axis of said input shaft and generally within a second plane arranged behind and parallel to the plane of the first said gear train, said second gear train being connectable with the output shaft when the input shaft is decoupled from said output shaft and being drivable via a hydraulic motor which is connected to said vehicle drive pump said first and second gear trains being decoupled from their respective input and output shafts when said input shaft and said output shaft are coupled, the mechanism being characterized in that the drive gears of the first and second gear trains which are coupled with the vehicle drive pump and the hydraulic motor respectively are displaced to either side of a central longitudinal plane through said input axis of the mechanism by a distance sufficient that the vehicle drive pump and the hydraulic motor are connected by flanges on the same side of a housing containing said first and second gear trains.

4,319,501

CONTROL SYSTEM FOR A TRANSMISSION FOR VEHICLES

Hiroshi Sugimoto, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

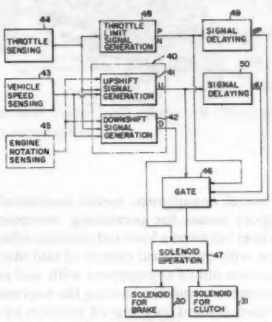
Filed Feb. 28, 1980, Ser. No. 125,582

Claims priority, application Japan, Mar. 14, 1979, 54-29637

Int. Cl.³ B60K *41/06*

U.S. Cl. 74—866 4 Claims

1. In a vehicle including an internal combustion engine and a transmission which has actuators and is adapted to be changed over between a high speed stage and a low speed stage according to operation of the actuators, a control system for the transmission comprising, a throttle sensing means which measures throttle opening of the engine and generates a throttle signal representing throttle opening of the engine, a vehicle speed sensing means which measures vehicle speed and generates a vehicle speed signal representing vehicle speed, an upshift signal generating means which receives said throttle signal and said vehicle speed signal and generates an upshift signal when throttle opening and vehicle speed are in a predetermined coordinated high speed range, a downshift signal generating means which receives said throttle signal and said vehicle speed signal and generates a downshift signal when throttle opening and vehicle speed are in a predetermined coordinated low speed range, a throttle limit signal generating means which receives said throttle signal and generates a first throttle limit signal when throttle opening of the engine is larger than a predetermined relatively small opening and a second throttle limit signal when throttle opening of the engine is smaller than said predetermined relatively small opening, a signal delaying means which receives said upshift signal and generates a delayed upshift signal, and an actuator control means which changes over operation of said actuators so that



once said upshift signal is provided, the transmission is set at said high speed stage and once said downshift signal is provided the transmission is set at said low speed stage, a first signal conducting means which conducts said upshift signal from said upshift signal generating means to said actuator control means, a second signal conducting means which conducts said downshift signal from said downshift signal generating means to said actuator control means, and a gate means provided at a middle portion of said first signal conducting means, said gate means being controlled by said delayed upshift signal, said second throttle limit signal and said first throttle limit signal so as to block transmittance of said upshift signal when said second throttle limit signal is provided before said delayed upshift signal is provided, and to release said blocking when said first throttle limit signal is provided.

4,319,502

PORTABLE SAW CHAIN SHARPENER

Victor W. Smith, 3435 Wards Creek Rd., Rogue River, Oreg. 97537

Filed Oct. 1, 1979, Ser. No. 80,292

Int. Cl.³ B23D *63/16*

U.S. Cl. 76—25 A 7 Claims

1. A saw chain sharpener for sharpening the cutters of a saw chain while the saw chain remains installed on the bar of a chain saw, comprising:

(a) a sharpener frame;

(b) sharpener mounting clamp means for securing said sharpener frame to said saw bar;

(c) a baseplate connected to said sharpener frame and lying above and perpendicular to said bar when said sharpener mounting clamp means is attached thereto;

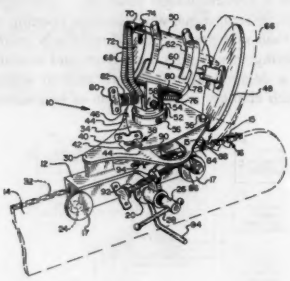
(d) a mounting plate located closely parallel to and pivotably connected with said baseplate for rotation with respect to said baseplate about a pivot axis extending generally perpendicular to said baseplate;

(e) a disc-shaped abrasive wheel and wheel support means operatively interconnected with said mounting plate for

mounting said abrasive wheel for rotation about its central axis;

(f) indicia means for visually indicating the angular position of said mounting plate with respect to said baseplate;

(g) clamping means for clamping said mounting plate to said baseplate in a selected angular position with respect to said baseplate, thereby positioning said wheel support means for grinding cutters of saw chains having various hook angles;



(h) abrasive wheel engagement means associated with said wheel support means for permitting movement of said abrasive wheel between a lowered position wherein it is in engagement with one of said cutters of said saw chain and a raised position out of engagement with said cuttter; and

(i) depth adjustment means for limiting the movement of said abrasive wheel toward its lowered position so as to limit the bevel depth provided by said sharpener.

4,319,503

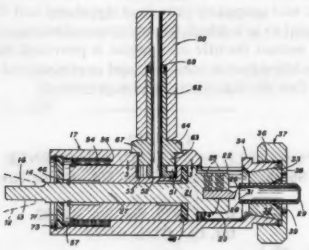
TUBE FACING MACHINE

Thomas W. Saine, Placerville, and John E. Pertle, Garden Valley, both of Calif., assignors to Tri Tool Inc., Rancho Cordova, Calif.

Filed Jun. 26, 1980, Ser. No. 163,331

Int. Cl.³ B23B *5/16*

U.S. Cl. 82—4 C **3 Claims**



1. Tube facing machine comprising:

a. an elongated, hollow, generally cylindrical body extending from an after end to a forward end, said body including a tube holding portion adjacent said forward end, a tube facing portion aft of said tube holding portion, and a facing cutter actuating portion;

b. collet means in said tube holding portion for positioning the end of a tube to be faced at a predetermined location within said tube facing portion of said body;

c. a drive shaft rotatably mounted within said facing cutter actuating portion, said shaft including means for mounting a facing cutter in the vicinity of the end of the tube to be faced;

d. means for rotating said drive shaft;

e. means for urging said drive shaft toward said forward end in order to urge the cutter into tube facing engagement with the adjacent end of the tube;

f. a sleeve slidably disposed in said facing cutter actuating portion of said body for movement in a longitudinal direction;

g. means for journaling said drive shaft in said sleeve;

h. means for translating said sleeve and said drive shaft in unison; and

i. wherein said drive shaft urging means includes a cam having a cam shaft rotatably mounted on said body and a cam face in engagement with said sleeve in order to translate said sleeve and said shaft as said cam shaft is rotated.

4,319,504

DAMPING DEVICE FOR ABRUPTLY OCCURRING FORCES IN A SHEAR OR SHEAR PRESS MACHINE

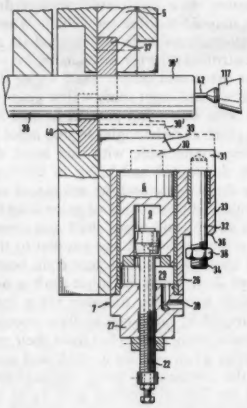
Joachim Wepner, Gevelsberg, and Kurt Wengenroth, Wuppertal, both of Fed. Rep. of Germany, assignors to Rolf Peddinghaus, Ennepetal, Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 124,247

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1979, 2909119

Int. Cl.³ B23D *15/04, 33/00*

U.S. Cl. 83—157 **5 Claims**

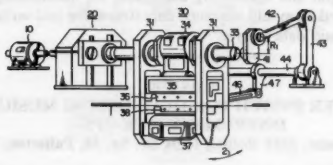


1. In a damping device for abruptly occurring forces in a shear or shear press machine, wherein a moving tool is guided opposite a stationary tool in the machine frame, a damping piston movable in the line of action of the moving tool attached to the stationary tool and slidable in a damping cylinder so as to displace a pressurized medium from said damping cylinder, a control piston slidable in a control cylinder positioned in axial direction within said damping piston so as to displace a pressurised medium from said control cylinder through a passage defined between said control piston and said control cylinder, said passage volume decreases by a relative amount as the loading increases down to a minimum volume at the moment of maximum loading, said control piston being secured to a base portion of said damping cylinder and adjustable over the entire stroke distance of said moving tool, a pressurized medium supply line through said control piston into said control cylinder and closeable by a non-return valve means associated therewith which also serves as a shunt throttle, said valve means having a valve element secured to a rod which extends through a piston rod which is secured to said control piston and in axial alignment therewith, said rod being selectively adjustable within said piston rod so as to permit selective adjustment of said valve element and thereby control the passage of pressurized medium through said valve means.

4,319,505
PENDULUM-TYPE FLYING SHEAR

Yukio Otake; Yuji Kikuchi; Tsuneo Nakanishi, all of Hitachi, and Keiji Miyakozawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 911,805, Jun. 2, 1978, abandoned. This application Apr. 30, 1980, Ser. No. 145,147
Claims priority, application Japan, Jul. 22, 1977, 52-88096
Int. Cl.³ B23D *25/06*
U.S. Cl. 83—295 **18 Claims**



1. A pendulum-type flying shear installed in a rolling line operative in various speeds for cropping a rolled material, wherein said flying shear is activated each time when one shearing operation is required and then stopped, said flying shear comprising a main crank shaft having first and second eccentric portions which are eccentric from a center line of the main crankshaft in different directions, respectively, a frame rotatably mounted on and suspended from said first eccentric portion of said main crankshaft, a lower cutting blade fixed to said frame, an upper cutting blade cooperating with said lower blade to shear a material to be sheared, said upper cutting blade being guided by said frame and connected to said second eccentric portion of said main crankshaft so that on rotation of said main crankshaft said lower and upper cutting blades move toward and away from each other, oscillating means for oscillating said frame about the first eccentric portion of said main crank shaft in synchronous relationship with movement of the material to be sheared so that at the instance of shearing said blades move substantially along a path of movement of said material to be sheared at a speed substantially the same as that of the movement of said material, and driving means for rotating said main crankshaft at a predetermined constant speed irrespective of the speed of movement of said material to be sheared, whereby a material to be sheared having a large shearing cross-section can be precisely sheared by a small power.

4,319,506
APPARATUS FOR THE PRECISION CUTTING OF HOLLOW FIBERS

Richard J. Warren, Franklin, and Friedhelm Bilewski, Medway, both of Mass., assignors to Albany International Corp., Albany, N.Y.

Filed May 30, 1980, Ser. No. 154,829
Int. Cl.³ B23D *25/12*; B26D *1/56*
U.S. Cl. 83—347 **2 Claims**

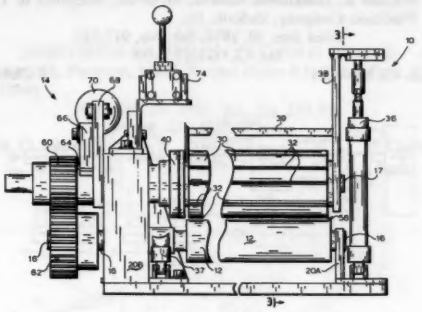
1. Apparatus for the precision cutting of a continuous strip of a hollow fiber into predetermined lengths, which comprises;

a first roller for the support of the strip during cutting, said roller having an elastomeric surface;

means for intermittently rotating the first roller while supporting the strip;

a plurality of cutting blades mounted about the periphery of a second roller and spaced apart from each other a distance equal to the desired predetermined lengths of the hollow fibers; and

means for intermittently rotating said second roller in spaced relationship from the first roller so that the blades will sever the strip of hollow fibers passing between the blades

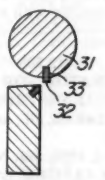


and the first roller, said means for rotating comprising a ratchet mechanism.

4,319,507
SHEARING DEVICE

Takajiro Kondo, Yasugi, and Toshitaka Asamoto, Matsue, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 879,582, Feb. 13, 1978, abandoned, which is a continuation of Ser. No. 508,628, Sep. 23, 1974, abandoned. This application Apr. 8, 1980, Ser. No. 138,382
Claims priority, application Japan, Sep. 26, 1973, 48-111486
Int. Cl.³ B23D *35/00*; B26D *7/26*
U.S. Cl. 83—694 **3 Claims**



1. In a shearing device having a pair of long narrow shearing tools for cutting a sheet web, at least one of the tools comprising:

a tool body with a coefficient of thermal expansion being provided with a groove arranged at an outer surface of the tool body, the groove having a rectangular cross section;

a shearing edge member, with a coefficient of thermal expansion different from that of the tool body, having at least one end with a rectangular cross section which is fitted with clearance in the groove such that the shearing edge member presents bonding surfaces to the tool body which cover the entire sidewall and bottom surfaces of the groove, the clearance of the thickness of the shearing edge member to the groove width being between 0.1 and 0.2 mm; and

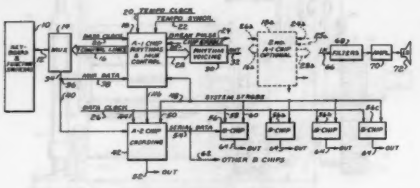
a thin layer of a relatively low temperature bonding agent being provided in the clearance for rigidly bonding the shearing edge member in the groove.

4,319,508

MODULAR, EXPANDABLE DIGITAL ORGAN SYSTEM

Harold O. Schwartz, Elburn; Dennis E. Kidd, Sycamore, and William R. Hoskinson, Geneva, all of Ill., assignors to The Wurlitzer Company, DeKalb, Ill.

Filed Jun. 20, 1978, Ser. No. 917,310
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.01 **5 Claims**



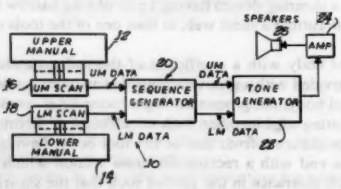
1. A modular expandable organ system comprising a keyboard having a plurality of keys and a plurality of key switches, amplifier means and electro-acoustic transducer means connected to said amplifier means, and means interconnecting said key switches and said amplifier means comprising at least one digital large scale integrated circuit chip having a plurality of outputs and further comprising means for carrying out logical arithmetic operations on digital pulse trains for generating electrical oscillations corresponding to musical tones and to control such oscillations for playing musical compositions and means for keying said electronic oscillations to said outputs, said oscillations generating means comprising a plurality of generators each capable of producing electronic oscillations corresponding to any of said keys, the outputs of said chip comprising a multiple of the number of generators, the keying means comprising a like multiple of keyers, a plurality of envelope control means, each control means being connected to a respective output means whereby a given oscillation may have a plurality of different envelopes, means interconnecting said output connections and said amplifier means, multiplexing means external of said chip interconnecting said key switches and said chip, and a single serial data line extending from said multiplexing means to said chip for controlling said generators and said keyers such that each of said generators can be assigned to operate with any key.

4,319,509

SEQUENCE GENERATOR FOR AN ELECTRONIC MUSICAL INSTRUMENT

William V. Machanian, DeKalb, Ill., assignor to The Wurlitzer Company, DeKalb, Ill.

Filed Jun. 3, 1980, Ser. No. 155,990
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **14 Claims**



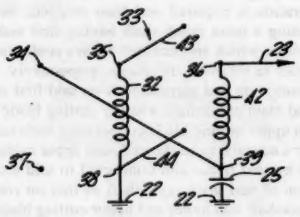
1. In an electronic musical instrument wherein scanning means scans the instrument and produces a serial data stream corresponding to notes played on the instrument in ascending order, a sequence generator system comprising: sequence generating means responsive to said serial data stream for repeatedly generating a sequence data stream corresponding, in sequentially ascending order, to the notes played and to all notes in higher octaves and octavely related to the notes played, said sequence generating means including recycling memory means receiving said serial data stream, and further including means for summing said serial data stream and the output of said recycling memory means to generate said sequence data stream, sequence control means for selecting data from said sequence data stream in either ascending order or descending order and data steering means for receiving said serial data stream and said data selected from said sequence data stream and for normally steering said serial data stream to a data output and selectively actuatable for substituting said data selected from said sequence data stream for said serial data stream at said data output.

4,319,510

SPLITTER SWITCH FOR HUMBUCKING MUSICAL INSTRUMENT PICK-UPS

C. Leo Fender, 2851 Rolling Hills Dr. Sp. 33, Fullerton, Calif. 92635

Filed May 5, 1980, Ser. No. 146,662
Int. Cl.³ G10H *3/00*
U.S. Cl. 84—1.15 **6 Claims**



1. In a pick-up for an electrical instrument of the type including first and second pick-up assemblies positioned in parallel, spaced relationship, each of said pick-up assemblies including at least one pole piece operatively associated with the strings of said instrument and a coil wound around said pole piece, the improvement comprising:

a capacitor, the value of said capacitor being selected to provide, when connected across one of said coils, a shunt for frequencies other than low frequencies in the audio frequency range; and

a switch interconnecting said coils and said capacitor, said switch being operative, in a first position thereof, to connect said coils in parallel with said capacitor unconnected, and, in a second position thereof, to connect said coils in series with said capacitor connected in parallel with only one of said coils.

4,319,511

TONE SOURCE FOR AN ELECTRONIC MUSICAL INSTRUMENT

Hiroshi Kato, Ageo, and Toshio Mishima, Kitamoto, both of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Continuation of Ser. No. 953,923, Oct. 23, 1978, abandoned. This application Apr. 7, 1981, Ser. No. 251,810
Claims priority, application Japan, Nov. 5, 1977, 52-132832
Int. Cl.³ G10H *1/06*
U.S. Cl. 84—1.22 **1 Claim**

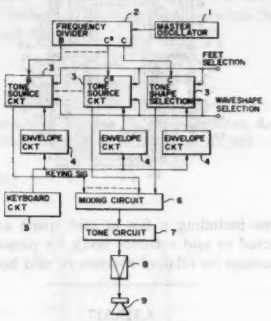
1. A tone source circuit for an electronic musical instrument comprising:

a top octave generator circuit means for frequency dividing a signal from a main oscillator to produce tone signals which respectively represent the highest frequency of each of the tones C to B of a 12 tone musical scale;

a respective frequency divider group having frequency dividing stages in each group for each of said 12 tone

signals for dividing the respective tone signals sequentially by 2 to obtain output tone signals having feet ratios selected from the group consisting of 1', 2', 4', 8', 16', and 32';

a feet select circuit means respectively selecting from each frequency divider group three tone signals, each of different feet ratios;



a waveshape circuit forming means forming a plurality of rectangular tone signal waveshapes of different duty ratios from said three tone signals;

a waveshape select circuit means controlling said waveshape circuit forming means to thereby select a rectangular tone signal waveshape of desired duty ratio; and

gate circuit means delivering said selected rectangular tone signal waveshape in response to a key depression signal provided from a keyboard.

4,319,512

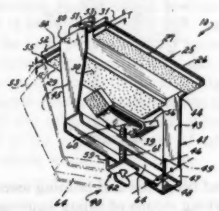
CAPOTASTO

C. Wayne Clyburn, Cincinnati, Ohio, assignor to James David Mfg. Corp., Creve Coeur, Mo.

Filed Jul. 17, 1980, Ser. No. 169,774

Int. Cl.³ G10D *3/04*

U.S. Cl. 84—318 **8 Claims**



1. A capotasto adapted for use with the fingerboard of a stringed instument, said fingerboard including a series of frets spaced one from another along the length thereof, said capotasto comprising

a force plate, said force plate being of a length sufficient to permit the leading edge portion of said force plate to overlie a leading fret of two adjacent frets on said fingerboard, and to permit the trailing edge portion of said force plate to overlie the trailing fret of two adjacent frets on said fingerboard, when said capotasto is installed on said instrument, said force plate including clamp pad means to press the strings of said instrument against the string contact edges of both said adjacent frets without significant bowing of said strings below said contact edges toward the instrument's fingerboard, and

a clamp mechanism connected to said force plate, said clamp mechanism cooperating with said force plate to retain said force plate in clamping relation with both said two adjacent frets when said capotasto is installed on said instrument.

4,319,513

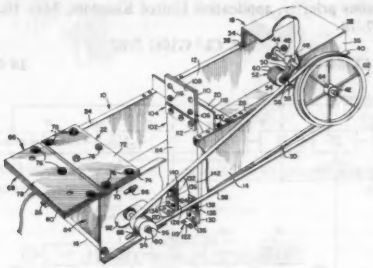
ELECTRICALLY DRIVEN TREMOLO DEVICE

Richard H. Peterson, 11748 Walnut Ridge Rd., Palos Park, Ill. 60464

Filed Sep. 23, 1980, Ser. No. 190,000

Int. Cl.³ G10B *3/18*

U.S. Cl. 84—348 **15 Claims**



1. A tremolo generator for connection to an air supply enclosure of a pipe organ, comprising;

an elongated housing having a fixed end and a free end;

eccentric weight means rotatably mounted at the free end of said housing;

a drive motor mounted on said housing for rotating said eccentric weight means; and

linking means intermediate said fixed and free ends and connecting said housing to the air supply enclosure of a pipe organ for transmitting motion of said housing due to rotation of said weight to the air supply enclosure to produce periodic tremulant variations in the pressure of the air supplied to the pipe organ.

4,319,514

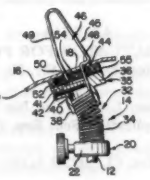
CYMBAL-MOUNTING DEVICE

David G. Donohoe, Corona, Calif., assignor to Aquarian Coatings Corp., Tustin, Calif.

Filed Jun. 2, 1980, Ser. No. 156,046

Int. Cl.³ G10D *13/06*

U.S. Cl. 84—421 **13 Claims**



1. A cymbal-mounting device adapted to be attached to a cymbal stand and the like, wherein the device comprises:

a bushing mount defining a support base to be attached to a cymbal stand;

a flexible cymbal-restraint means secured to said bushing mount, wherein a cymbal is held in a substantially fixed position without affecting the resonant vibration of the cymbal when struck;

wherein said flexible cymbal restraint comprises:

a lower flexible tubular member adapted to be attached to said bushing mount; and

a keeper member formed to releasably lock said cymbal to said device; and

a cymbal-support bracket affixed to said flexible cymbal-restraint means, whereby said flexible cymbal-restraint means can geniculate at a point between said bushing mount and said support bracket.

4,319,515

TUNING AID FOR TUNING MUSICAL INSTRUMENTS

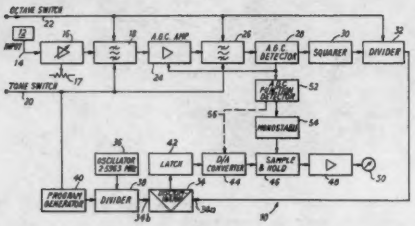
Robin Mackworth-Young, Garden House, Windsor Castle, Berkshire SL4 1NG, England

Filed May 4, 1979, Ser. No. 36,260

Claims priority, application United Kingdom, May 10, 1978, 18737/78

Int. Cl.³ G10G 7/02

U.S. Cl. 84—454 **14 Claims**



1. A tuning aid for tuning musical instruments, comprising:

an input for connection to an audio sensor;

manually operable setting controls for setting the nominal octave and note of the signal being measured;

amplifying and band-pass filtering means coupled to the input and responsive to the setting controls;

first dividing means responsive to the setting controls for dividing the frequency of the detected signal by a factor dependent upon the octave determined by the setting controls;

a high stability oscillator;

a second dividing means for dividing the output of the oscillator by a factor dependent upon the note determined by the setting control;

comparison means for counting the number of pulses from the second dividing means for a period of time set by the output of the first dividing means to thereby compare the frequencies of the first and second dividing means; and

display means for displaying the output of the comparison means.

4,319,516

FAN-COOLED ACTUATOR FOR POWER CHUCK

Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Nov. 1, 1979, Ser. No. 90,300

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1978, 2847950

Int. Cl.³ B23B 31/30

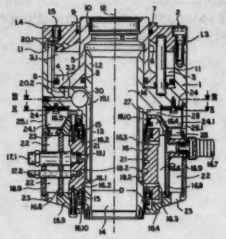
U.S. Cl. 91—420 **9 Claims**

1. A hydraulic actuator comprising:

an actuator body centered on an axis, formed with a chamber, and having an axially backwardly projecting extension;

a piston axially subdividing said chamber into front and back compartments and having a portion projecting axially forwardly from said actuator body;

a connector body carried on said extension and rotatable thereon about said axis, said bodies having confronting end faces together forming an annular space, said connector body having a pair of end caps and concentric and radially spaced inner and outer tube sections axially bridging said end caps and forming an annular chamber constituting an axially throughgoing passage opening at said space, said section, caps, and connector body being of heat-conducting material; and



fan means including a fan in said space and operatively connected to said actuator body for passing air through said passage on relative rotation of said bodies.

4,319,517

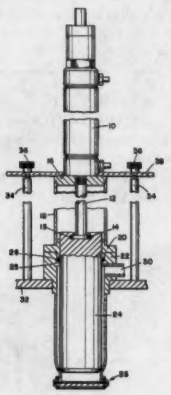
PISTON FILLER

David E. McCaleb, Minneapolis, Minn., assignor to Liquipak International, Inc., St. Paul, Minn.

Filed Jun. 18, 1980, Ser. No. 160,518

Int. Cl.³ F01B 29/00

U.S. Cl. 92—128 **1 Claim**



1. An improved fill piston and housing assembly for attachment to the working means of filling equipment which comprises:

an arm having one end secured to the working means of the filling equipment and having a T-shaped connection at the opposite end;

a mounting flange having one face secured to the filling equipment, having a hole therethrough to accommodate said arm and having a circular raised portion on its opposite face;

a hollow cylindrical spacer tube having one end in mating engagement with the mounting flange and the raised portion thereof;

a guide bushing having one face in mating engagement with the opposite end of the spacer tube and having an opening therethrough;

a metering cylinder in mating engagement with the opposite face of the guide bushing but notched so as to provide an annular groove on the inside surface at their junction, having an entry port and an exit port and provided with

external clamping means interconnecting with said mounting flange;

a cylindrical piston disposed within the annular cavity defined by the spacer tube, guide bushing and metering cylinder having at one end a T-shaped notch to accommodate the T-shaped connection of the arm; and

means disposed within the annular groove at the junction of the guide bushing to provide a seal between the metering cylinder and the piston.

4,319,518

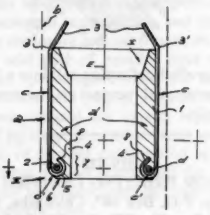
WELL SWAB CUPS

Miguel F. Vicens, 615 Mexico St., Buenos Aires, Argentina

Filed Oct. 16, 1979, Ser. No. 85,383

Int. Cl.³ F16J *9/00*

U.S. Cl. 92—241 **6 Claims**



1. An improved swab cup for tubing of oil wells which comprises a tubular body of resilient material with a plurality of parallel reinforcing flexible metallic wires extending lengthwise and equally spaced around the tubular body, each wire having a long intermediate portion embedded into the external surface of said body and a lower end portion embedded in the lower part of the body and curved inwardly, upwardly and then towards the inner surface of an intermediate portion of said body, a retainer ring embedded in the lower part of said body, each lower wire end portion forming a hook which relatively loosely connects upwardly with said retaining ring which has common connection to all said reinforcing wires, there being an annular portion of the resilient material of the body interposed at least between the inner peripheral surface of said ring and the inner portions of said hooks and each hook providing articulated engagement with the ring within the lower annular portion of the body for allowing the reinforcing wires to be displaced toward the surrounding tubing according the expansion of the tubular cup body, whereby said wires become adapted to the surface contour of said tubing practically along the whole length of said body.

4,319,519

ARRANGEMENT IN A VENTILATION SYSTEM FOR A VEHICLE

Nils O. Pärsson, Trollhättan, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

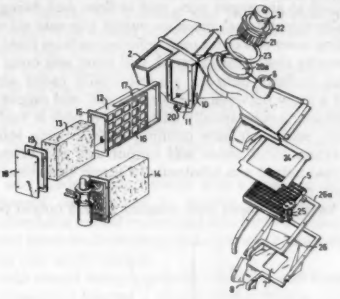
Filed Apr. 10, 1979, Ser. No. 28,699

Claims priority, application Sweden, Apr. 18, 1978, 7804358

Int. Cl.³ B60H *3/00*

U.S. Cl. 98—2.11 **6 Claims**

1. An arrangement in a ventilation system for a vehicle passenger compartment, comprising a ventilation housing mounted transverse at the forward part of the passenger compartment and formed with a through passage for leading air from an outer air intake to at least one air outlet opening out in the vehicle passenger compartment, a fan for acting on the air flow through said passage, said housing having at least one opening, an insert unit inserted into said opening so as to extend transverse of the through passage, the insert having portions engaging with portions of the ventilating housing, and means fastening some of the engaged portions of the housing and unit to each other so as to mount the unit on the housing,



the unit being an air filter in a cassette or an evaporator for an air cooling system.

4,319,520

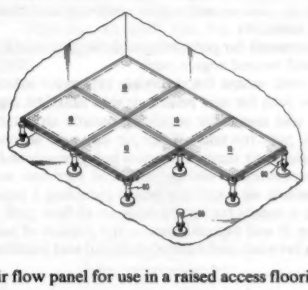
AIR FLOW FLOOR PANEL

Richard J. Lanting, Kentwood, and Robert J. Munsey, Caledonia, both of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 7, 1980, Ser. No. 110,279

Int. Cl.³ E04B *5/48*

U.S. Cl. 98—37 **15 Claims**



1. An air flow panel for use in a raised access flooring system comprising:

an articulate frame having at least upper and lower inwardly directed flanges;

an interfitted grid structure surrounded by said articulated frame;

a top plate having a plurality of apertures therethrough welded to both said upper inwardly directed flange on said articulated frame and at predetermined locations on said grid structure; and

damper means secured to said lower inwardly directed flange on said articulated frame.

4,319,521

AIR DISTRIBUTION SYSTEM

Dimiter Gorchev, Boston, Mass.; Karl U. Ingard, Kittery Point, Me., and Herbert L. Willke, Jr., Cambridge, Mass., assignors to Mitco Corporation, Somerville, Mass.

Continuation-in-part of Ser. No. 944,134, Sep. 20, 1978. This application Feb. 1, 1980, Ser. No. 117,476

Int. Cl.³ F24F *7/06*

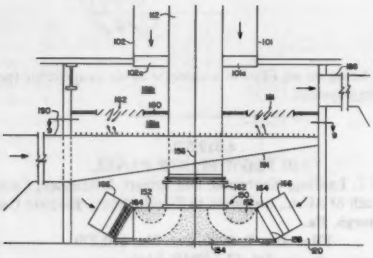
U.S. Cl. 98—38 E **14 Claims**

1. An air distribution system comprising, in combination:

A. a plenum including means for receiving outside air and means for receiving return air,

B. input flow concentrator and integral silencer disposed within said plenum, said concentrator silencer including a concentrator input port coupled to said plenum and sidewalls establishing an airflow path from said concentrator input port to an output port, said airflow path being substantially symmetrical about an output axis said sidewalls including inner and outer path defining surfaces lined with acoustically absorbent material, said inner and outer path defining surfaces defining a substantially radial airflow path at a point between said plenum and said output port and defining a substantially axial airflow path at said output port, said inner path defining surface being substantially symmetrical about said output axis and extending along said output axis substantially across said concentrator input port,

C. a fan having an input port coupled to said output port,



wherein said plenum includes:

means for partitioning said plenum into first and second regions, said second region enclosing said concentrator and silencer,

damper means for permitting airflow from said first region to said second region, and

wherein said means for receiving return air establishes an airflow path for said return air into said first region, and

wherein said means for receiving outside air establishes an airflow path for said outside air into said second region, said outside air receiving means being positioned between said concentrator/silencer and said partition means, and said outside air receiving means including a tapered duct having a means for establishing an airflow path from the interior of said tapered duct to the portion of said second region between said tapered duct and said partition means.

4,319,522

ROLLING MILL FOR ROLLING WEB-LIKE MATERIALS

Ignazio Marchioro, Schio, Italy, and Wolf-Gunter Stotz, Ravensburg, Fed. Rep. of Germany, assignors to Escher Wyss Limited, Zürich, Switzerland

Filed Apr. 18, 1980, Ser. No. 141,479

Claims priority, application Switzerland, May 10, 1979, 4368/79

Int. Cl.³ B30B *3/04*; B21B *13/02*

U.S. Cl. 100—162 B **10 Claims**

1. A rolling mill for rolling substantially web-shaped materials and containing a plurality of rolls, comprising:

frame means;

one of said plurality of rolls being a controlled deflection roll comprising:

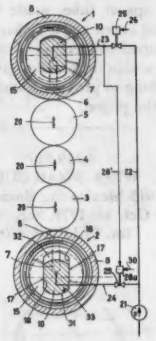
a roll support secured in said frame means;

a roll shell rotatable about said roll support;

pressure elements for exerting a pressure force effective upon a counter roll; said pressure elements supporting said roll shell upon said roll support;

means for movably mounting the roll shell for performing lifting movements, in a pressing direction of the controlled deflection roll, along its entire length 1in relation to the roll support; and

impact means which are stationary with respect to said frame means in order to support the roll shell of the controlled deflection roll in the pressing position and to transform said controlled deflection roll into a fixed roll defining a static point with respect to the remainder of said plurality of rolls.



4,319,523

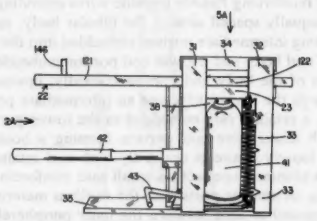
APPARATUS FOR PRINTING LEATHER PRODUCTS

Charles P. Mackey, P.O. Box 847, Chickasha, Okla. 73018

Filed Sep. 10, 1979, Ser. No. 74,243

Int. Cl.³ B44B *5/00*

U.S. Cl. 101—3 R **3 Claims**



1. An apparatus for imprinting on leather comprising a main fixed frame, a die carrier support frame, a pressure developing means, and a movable die carrier jig, said pressure developing means attached to said main fixed frame and to said die carrier support frame,

said main fixed frame comprising a base, vertically extending side frame members and an anvil member, said base extending parallel to said anvil member and said base firmly attached to one end of said vertically extending side frame members and another end of said vertically extending side frame members firmly attached to said anvil member, said base comprising a horizontally extending rigid plate, said vertically extending side frame members comprising a plurality of like rigid vertically extending beams, said anvil member comprising a rigid vertically and horizontally extending flat bottomed plate, said vertically extending side frame members extending at a right angle to said base and said anvil member extending at a right angle to said vertically extending side frame members, a fixed frame enclosure located between said one end of said vertically extending frame members and said another end of said frame members,

said pressure developing means and a part of said die carrier support frame located in said fixed frame enclosure,

said pressure developing means comprising a fixed portion attached to and fixedly supported on said base, and a

movable piston portion, said movable piston portion movable within said fixed portion, and control means attached to said pressure developing means to move said movable piston portion relative to said fixed portion, said movable piston portion being movable relative to said fixed portion in a direction parallel to the length of said vertically extending side frame members,

said die carrier support frame comprising a pair of parallel rigid spaced-apart side members, a first part of each of said pair of parallel rigid spaced-apart side members extending between said anvil member and said movable piston portion and attached to said piston portion, and a second portion of each of said pair of parallel rigid spaced-apart side members contiguous with and continuous with said first part of each of said pair of parallel rigid spaced-apart side members end extending laterally to one side of said fixed frame enclosure,

said die carrier jig assembly comprising a pair of parallel rigid straight longitudinal die support members each of uniform transverse cross section and located within said fixed frame enclosure and each with its length extending parallel to said pair of parallel rigid spaced-apart side members and spaced apart transverse to their length and located between said pair of parallel rigid spaced-apart side members of said die carrier support frame and a plurality of jig support members each movably supported on said pair of parallel rigid spaced apart side members and comprising a rigid beam, said die support members each attached at spaced apart portions thereof to said jig support members, and

a plurality of dies carried by said die carrier jig assembly, each of said dies comprising a die body, a cutting portion, and a die tongue, said die body resting on said die support members, said cutting portion extending upwardly thereof and said tongue portion attached to said die body and slidably yet firmly located between said die support members.

4,319,524

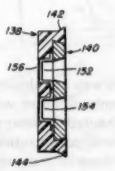
ABRASIVE STENCILING APPARATUS

Philip N. Dunham, Biddeford; Armand Martin, Saco, and Gregory G. A. Peck, Biddeford, all of Me., assignors to Prevent-A-Theft International Ltd., Biddeford, Me.

Filed Feb. 20, 1980, Ser. No. 123,108

Int. Cl.³ B05C *17/08*; B41L *13/02*; G09F *7/08*

U.S. Cl. 101—128 **2 Claims**



1. A head assembly for mounting stencils across the discharge end of an apparatus adapted to direct a stream of abrasive particles toward said stencils for marking a work surface, comprising:

(a) an open ended cup adapted to fit snugly over said discharge end, said cup being of a relatively soft resilient material and formed with a forwardly facing inner shoulder adapted to bear against a cooperating rearwardly facing outer shoulder formed on said apparatus near said discharge end,

(b) a stencil holder of a slightly flexible semi rigid material detachably connected to said cup across the open distal end thereof,

(c) said holder being formed with at least one elongated aperture therein adapted to expose a plurality of stencil elements positioned in side-by-side abutting relation along said aperture,

(d) a relatively stiff backing member generally coextensive with the rear face of said holder and detachably mountable thereto for holding said stencil elements in place formed with at least one elongated aperture in registration with said holder aperture, and,

(e) at least one stencil mountable in said holder,

(f) the forward portion of said cup being formed with parallel grooves along opposite edges thereof to slidably receive cooperating parallel opposite edges of said holder,

(g) the front face of each stencil being flush with front face of said holder,

(h) said holder being formed with a recess in the rear face thereof dimensioned to receive said backing member mountable in said recess said apertures defining a path for said particles to impinge and reproduce said stencil indicia on said work surface,

(i) said stencil being generally U-shaped and formed with a cross-piece bearing a stencil indicia therein, a leg extending in the same directions perpendicularly from each of the upper and lower edges of said cross-piece and a flange extending in opposite directions perpendicularly from the ends of said legs, the height of said cross-piece generally corresponding to the height of said aperture and the length of said legs generally corresponding to the depth of said aperture.

4,319,525

OFFSET PRINTING MACHINE INK HOMOGENIZING AND DRYING SYSTEM

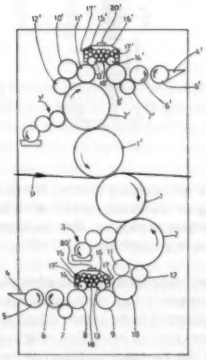
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Sep. 12, 1980, Ser. No. 186,438

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1979, 2942690

Int. Cl.³ B41F *31/14, 31/26*

U.S. Cl. 101—350 **10 Claims**



1. In an offset printing machine having an inking system including a plurality of ink distribution rollers (6, 7, 8, 9, 10, 11, 12: 6′ 7′, 8′, 10′, 11′, 12′) forming an ink train,

apparatus for homogenizing and drying ink in the ink train comprising, in accordance with the invention,

a cage-like holder (16) positioned adjacent one of the ink distribution rollers and having confining end walls (17, 17′) and a closed bottom wall (18, 18′);

two ink transferring rollers (13, 14; 13′ 14′) having an ink accepting surface projecting from the cage-like holder and positioned, respectively, in surface engagement and in frictional rotation transfer relation with two adjacent ink distribution rollers (8, 13; 8′, 13′) of the ink train for receiv-

ing ink from and transferring into to respective ink distribution rollers,

the ink transferring rollers projecting through the bottom wall (**18, 18'**) for driving surface contact with the respective ink distribution rollers (**8, 9, 8', 11'**) of the ink train;

and a plurality of loose roller elements (**15, 15'**) freely, centerless floatingly located in the cage-like holder for centerless self-positioned rolling movement between the confining walls and the bottom walls of the cage, some of the roller elements being in surface engagement with said ink transferring rollers (**13, 14, 13', 14'**) and some of the roller elements (**15, 15'**) being in surface engagement with each other to increase the surface area of ink being transported in the ink train,

the plurality of roller elements (**15, 15'**) being of such number that the distance within the cage-like holder (**16, 16'**) between the ink transferring rollers (**13, 14; 13', 14'**) is spanned by at least some of the roller elements, and which will assume positions between the ink transferring rollers,

the plurality of roller elements being rotated by surface frictional engagement with the ink transferring rollers (**13, 14, 13', 14'**).

4,319,526

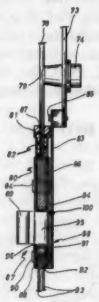
EXPLOSIVE SAFE-ARMING SYSTEM FOR PERFORATING GUNS

Raymond W. DerMott, Houston, Tex., assignor to Schlumberger Technology Corp., Houston, Tex.

Filed Dec. 17, 1979, Ser. No. 103,997

Int. Cl.³ F42C *15/34*

U.S. Cl. 102—310 **16 Claims**



9. An explosive safe-arming system, for use with a well bore perforator having an enclosed carrier with an access port and a receptor detonating explosive, therein, comprising:

a donor detonating explosive including two encased elements;

the first element being fixedly secured within the carrier; and

the second element being removably mounted within the carrier and adapted to be inserted into the carrier through the access port into an operative relationship with the first element and the receptor detonating explosive.

4,319,527

BLASTING CHARGE FOR A BLAST ACTUATED HIGH-VOLTAGE POWER SWITCH

Lutz Niemeyer, Baden, and Klaus Ragaller, Neuenhof, both of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Jan. 10, 1980, Ser. No. 111,176

Claims priority, application Switzerland, Jan. 11, 1979, 244/79

Int. Cl.³ F42B *3/00*

U.S. Cl. 102—314 **8 Claims**

1. In a blast-actuated high voltage power switch comprising a blasting charge, the improvement wherein said blasting charge comprises a blasting powder which contains at least one compound which thermally decomposes during the explosion of the charge to form electro-negative radicals.

4,319,528

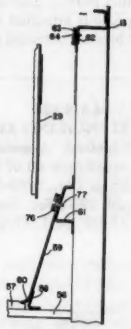
RAILWAY PASSENGER CAR INTERIOR PANELING AND FINISH ASSEMBLY

Jack E. Gutridge, Dyer, and Ernest J. Nagy, Munster, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Nov. 13, 1978, Ser. No. 960,406

Int. Cl.³ B61D *17/08, 17/18, 49/00*

U.S. Cl. 105—397 **6 Claims**



1. In a passenger railway car having a body including a plurality of support members, outer wall construction including outer sheathing connected to outer portions of said support members, and interior wall construction spanned between and connected to inner portions of the support member, the interior wall construction consisting of at least one interior panel including a section of interior sheathing, the improvement being means for connecting each interior panel to the support members comprising the combination of:

first extrusion means being removably secured relative to the interior portions of the support members,

said first extrusion means having a recess receiving an edge portion of the interior panel,

second extrusion means having a portion being overlapped in part by another edge of the interior panel, and being provided with a recess opening away from the outer wall construction, and

third extrusion means being releasably interlocked with said second extrusion means and thereupon also in part overlapping the other edge of the interior panel to hold the same against said underlying second extrusion,

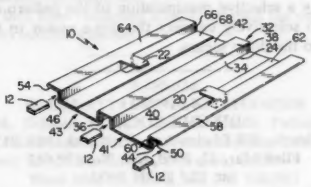
said third extrusion means comprising a rigid locking portion adapted to be snap fitted within the recess of the second extrusion means.

4,319,529

EXPENDABLE PALLET

Ira W. Beal, P108 Lake Bloomington, RR#1, Hudson, Ill. 61748

Filed Feb. 4, 1980, Ser. No. 118,586
Int. Cl.³ B65D *19/34*
U.S. Cl. 108—51.3 **5 Claims**



1. An expendable pallet comprising:

at least one material receiving trough having a base and a vertical wall at each edge of said base;

wings extending outwardly from the upper portion of each of said walls, said wings being parallel to said trough and defining a lifting force application area external to said trough; and

means providing a second layer to said wings and a portion of said trough base to define an inner partial base, said means defining upper and lower wings connected together,

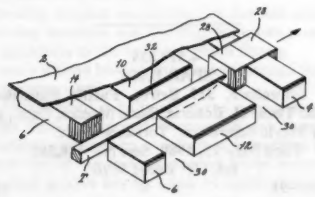
said means further defining a second inner vertical wall parallel to each of said vertical walls wherein each inner vertical wall respectively connects each of said upper wings with a corresponding inner partial base.

4,319,530

PALLET HAVING RUNNERS WITH DISPLACEABLE SECTIONS

John F. Moog, Creve Coeur, Mo., assignor to Innovative Enterprises, Inc., Webster Groves, Mo.

Filed Mar. 3, 1980, Ser. No. 126,875
Int. Cl.³ B65D *19/34*
U.S. Cl. 108—51.3 **16 Claims**



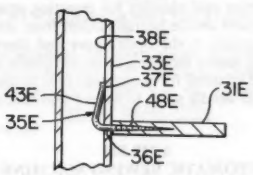
1. A pallet comprising: a deck having an upwardly presented surface on which a load may be supported and a downwardly presented surface; runners attached to the deck at its downwardly presented surface near the sides of the deck and extending along the deck generally parallel to each other for supporting the deck in an elevated position above a supporting surface, each runner being formed from paper arranged in a honeycomb configuration so as to include a multiplicity of parallel honeycomb cells, the axes of which are generally perpendicular to the deck, each runner being substantially continuous along its side of the deck and having a pair of sections that are connected to the remainder of the runner at regions of weakness but are otherwise detached from the deck so that a laterally directed force applied to any section will cause it to separate from the remainder of the runner and create a void in the runner, the sections of each runner being spaced apart sufficiently to accommodate the tines of a forklift or handtruck, corresponding sections in the two runners being aligned with each other; and a pair of end pads and a center pad attached to the deck at its downwardly presented surface between the two runners such that the end pads are located along the ends of the deck and the center pad is between the two end pads generally beneath the center of the deck, the runners and the pads being spaced apart to provide entry slots which open out of the ends of the pallet, with the slots being wide enough and spaced apart sufficiently to accommodate the tines of a forklift or handtruck, the pads being further positioned such that cross channels exist between the end pads and the center pad, with the cross channels being aligned with and wide enough to accommodate the displaceable sections of the runners, each pad being formed from paper arranged in a honeycomb configuration so as to include a multiplicity of parallel honeycomb cells with the axes of the cells being perpendicular to the deck.

4,319,531

SHELF MOUNTING SYSTEM, PARTS THEREFOR AND METHOD OF MAKING THE SAME

Edward N. Caldwell, Knoxville, Tenn., assignor to Dulen Products, Inc., Knoxville, Tenn.

Filed Nov. 14, 1979, Ser. No. 94,163
Int. Cl.³ A47F *5/08*
U.S. Cl. 108—152 **4 Claims**



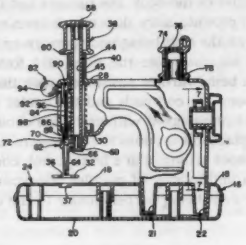
1. In a mounting system wherein an object is mounted to one side of a wall means by at least one rigid hanger interconnected by one portion thereof to said object and having an installing portion thereof disposed in an opening of said wall means and bearing against the other side of said wall means, the improvement wherein said hanger comprises a one-piece rod-like member of a generally uniform cross-sectional configuration throughout its length and having a straight section and a curved section integrally interconnected thereto so as to define a generally J-shape, said straight section thereof being disposed in said opening and projecting generally horizontally from said one side of said wall means to define said one portion thereof and support at least part of said object thereon, said curved section being disposed adjacent said other side of said wall means in spaced relation thereto, said curved section having a substantially straight free end portion thereof disposed generally perpendicular to said straight section and engaging aginst said other side of said wall means in a load bearing manner, said installing portion of said hanger thereby comprising said curved section and the part of said straight section that is disposed in said opening, said opening being generally of the same cross-sectional size and said cross-sectional configuration of said hanger, said object comprising a shelf that is disposed generally transverse to said one side of said wall means and generally horizontal, said one portion of said hanger being threaded, said object having an opening therein, said one portion of said hanger being threaded into said opening of said object to interconnect said object and said hanger together.

4,319,532

TOY SEWING MACHINE

Bonnie R. Fogarty, and A. Edward Fogarty, both of Sarasota, Fla., assignors to Hasbro Industries, Inc., Pawtucket, R.I.

Filed Jun. 30, 1980, Ser. No. 164,552
Int. Cl.³ D05C *15/02;* D05B *1/00*
U.S. Cl. 112—79.5 **9 Claims**



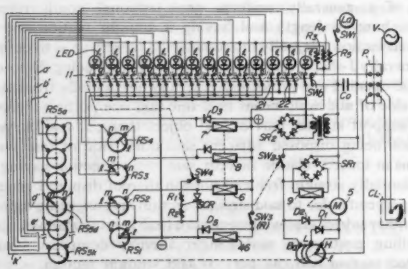
1. A toy device adapted to loop a strand through sheet material so as to simulate sewing and the like, comprising a housing including a platform for receipt of said material and a head vertically spaced above said platform, an upwardly biased spring loaded plunger having a strand receiving hollow needle extending downwardly therefrom mounted on said head for reciprocal vertical movement with respect to said head between an upper position wherein said needle is positioned above the material supported on said platform and a lower position wherein the lower end of said needle is adapted to project through said material, means supported by said head and separate from said plunger for inserting strand into said hollow needle, said needle laterally offset from said plunger so as to provide access to the open upper end thereof and said strand inserting means incuding a rod vertically aligned with said needle and adapted for movement into at least the upper open end of said needle so as to thread said needle.

4,319,533

AUTOMATIC SEWING MACHINE

Noboru Kasuga, Hachioji, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 813,491, Jul. 7, 1977, abandoned. This application Nov. 16, 1979, Ser. No. 95,088
Claims priority, application Japan, Jul. 9, 1976, 51-81593
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—158 E **7 Claims**



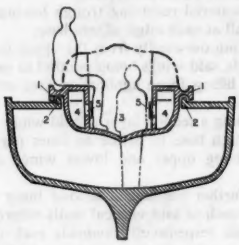
7. An automatic sewing machine comprising a machine housing; a main shaft rotatably mounted in the machine housing; a needle bar with a needle arranged in the housing for vertically reciprocating movement and being driven by the main shaft; a drive motor for rotating the main shaft; pattern information carrying means including a pack of individual pattern cams and rotated at a reduced speed by the main shaft; pattern cam selecting means rotated to select the pattern cams; drive means operatively connected to the drive motor to rotate the pattern cam selecting means; follower means arranged opposite to the cam selecting means and selectively operated by the latter to engage the pattern cams; pattern selecting switches arranged on the machine housing and manually operated to select one of the pattern cams; electric circuit means operatively connecting the pattern selecting switches to the drive motor and operated by a selective operation of the pattern selecting switches to activate the drive motor; transmission means selectively connecting the drive motor to the main shaft and to the drive means; and clutch means selectively operated by a selective manipulation of the pattern selecting switches to selectively connect the drive motor to the main shaft and to the drive means.

4,319,534

DINGHY COCKPIT

Barry K. Fleagle, 108 Linden Ave., Frederick, Md. 21701

Filed Mar. 17, 1980, Ser. No. 130,612
Int. Cl.³ B63H *9/00*
U.S. Cl. 114—39 **2 Claims**



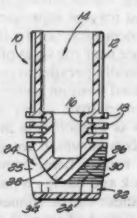
1. In a water born sailing vessel including a hull and a deck having a cockpit for the helmsman and passengers of the vessel, the improvement which comprises: an opening in said deck the shape and size and position of the cockpit; a removable member stowable in said opening and forming the cockpit when so stowed for the helmsman and passengers of the vessel and said member when in an inverted position and located over the same said opening forming a cabin top, said member being an integral portion of the deck in either the normal or inverted position.

4,319,535

SPAR BASE

Henry H. Schweitzer, 317 Beirut, Pacific Palisades, Calif. 90272, and Thane H. Roberts, Santa Monica, Calif., assignors to Henry Hoyle Schweitzer, Torrance, Calif.

Filed May 12, 1980, Ser. No. 148,881
Int. Cl.³ B63H *9/10*
U.S. Cl. 114—91 **13 Claims**



1. A spar base comprising:

a cylindrical tubular member having a spar-receiving bore therein at one end of the tubular member;

the opposite end of the tubular member having a first and a second passage therethrough extending generally perpendicular to the longitudinal axis of the tubular member;

each passage having associated therewith a pair of grooves in the tubular member, each formed between a pair of opposed side walls and a longitudinally inward slanting surface and opening into the respective one of the passages;

one of the grooves having on the opposed side walls thereof a plurality of teeth; and

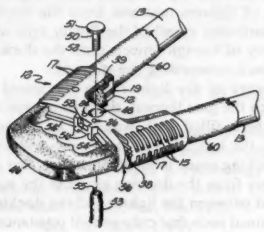
a spar bolt bore extending axially through the opposite end of the tubular member.

4,319,536

BOOM ATTACHING MECHANISM

Henry H. Schweitzer, 317 Beirut, Pacific Palisades, Calif. 90272, and Thane H. Roberts, Santa Monica, Calif., assignors to Henry Hoyle Schweitzer, Torrance, Calif.

Filed May 12, 1980, Ser. No. 148,882
Int. Cl.³ B63B *15/00*
U.S. Cl. 114—99 **6 Claims**



1. A spar-end boom fitting, comprising:

a first boom receiving member having a boom receiving bore therein;

a second boom receiving member having a boom receiving bore therein, each boom receiving member having a plurality of parallel ribs extending radially outward from at least a portion of the boom receiving member and interconnected by a spine extending longitudinally from the boom receiving member;

a connecting member connecting the first and second boom receiving members and forming therewith a spar receiving identation in the spar-end boom fitting;

a first and a second lashing line passage through the connecting member, and,

a jam cleat formed radially about the circumference of one of the first and second boom receiving members, and including a tapered groove formed between a pair of the ribs of one of the first and second boom receiving members, said groove having a pair of opposed rows of teeth.

4,319,537

SAILCRAFT TRAVELER CAR AND ASSEMBLY

John Hackney, 1026 NW. 16th St., Stuart, Fla. 33494

Filed Apr. 25, 1980, Ser. No. 144,045
Int. Cl.³ B63B *21/04*; B63H *9/10*
U.S. Cl. 114—112 **10 Claims**

1. A car for the track of a sailcraft traveler which comprises:

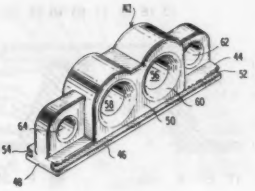
a rectangular base portion having a substantially flat bottom surface, a pair of parallel longitudinal sides and a pair of parallel narrow ends,

a body portion integral with said base portion that extends upwardly from said base portion and perpendicular thereto,

a first longitudinal slot along the entire length of one of said longitudinal sides positioned between said bottom surface and said body portion,

a second longitudinal slot similar to said first slot along the other side of said base portion,

a first pair of parallel cylindrical holes through said body portion transverse to the major axis of said body portion, the entrances to said holes on each side of said body portion being well chamfered,



a second pair of transverse cylindrical holes through said body portion separated from one another by said first pair of holes,

the size of said first pair of holes being substantially identical, and

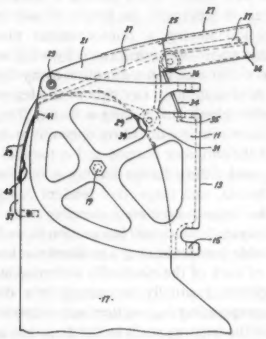
the size of said second pair of holes being substantially identical and substantially smaller than the size of said first pair.

4,319,538

KICKUP RUDDER ASSEMBLY HAVING ROLLER DETENT

Richard O. Macfarlane, Mosman Fields, Australia, assignor to Windrush Nominees Pty. Ltd., O'Conner, Australia

Filed Mar. 7, 1980, Ser. No. 127,974
Int. Cl.³ B63H *25/06*
U.S. Cl. 114—165 **8 Claims**



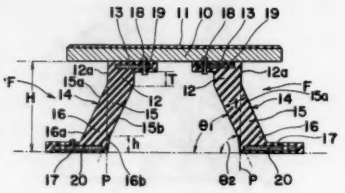
1. A rudder assembly for a sailing craft comprising a housing adapted to be pivotally mounted on the stern of the craft for rotation about a substantially vertical axis, and a rudder pivotally mounted in said housing for rotation about a substantially horizontal transverse axis, said rudder being pivotal about said horizontal axis between a downwardly projecting position and a rearwardly projecting position, means for holding the rudder in either of said positions, said means comprising first and second indentations formed in said rudder and corresponding to the respective of said positions, said first indentation lying at a different distance from said horizontal axis than said second indentation, and a roller urged into engagement with a selected one of said indentations.

4,319,539

CUSHIONING FENDER ASSEMBLY

Masaru Fujii, Ashiya; Tomokazu Kashiwara, and Tetsuo Yamaguchi, both of Nishinomiya, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Dec. 26, 1978, Ser. No. 972,830
Claims priority, application Japan, Jul. 12, 1978, 53/96711[U]
Int. Cl.³ B63B *21/00*; E02B *3/22*; F16F *7/12*
U.S. Cl. 114—219 2 Claims



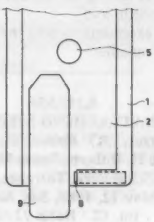
1. A fender assembly adapted to be mounted on one or both of an impact applying element and an impact receiving element for cushioning the impact applied from the inpact applying element to the impact receiving element, said fender assembly comprising an elongated impact receiving member made of a rigid material and at least one pair of elastically deformable fenders of the same construction connected to said impact receiving member and extending therefrom so as to diverge from each other in a direction away from the impact receiving member, each of said elastically deformable fenders including an elongated body of one-piece construction made of an elastic material and further including a buffer block of substantially rectangular cross section extending at right angles to the plane of the impact receiving surface, said buffer block having an outer surface formed integrally with a shoulder portion protruding outwards therefrom in a direction parallel to said buffer block, said buffer block having a thickness of 0.15 to 0.35H, wherein H represents the height of said fender and said shoulder portion having a reinforcement plate embedded therein and a support wall constituted by a leg section extending from said buffer block in a direction away from said buffer block and a heel section on one side of the leg section remote from the buffer block and having a fitting flange outwardly protruding therefrom in a direction opposite to the direction of protrusion of the shoulder portion and in parallel to said shoulder portion, said fitting flange having a reinforcement plate embedded therein, said respective fenders being rigidly connected to the impact receiving member with the shoulder portions anchored thereto, said leg section in each of the elastically deformable fenders having a uniform thickness while said heel section of each of the elastically deformable fenders has a varying thickness gradually increasing in a direction away from the corresponding leg section and wherein the angle of divergence of the support walls in the direction away from the impact receiving member is so selected that the leg section of each support wall forms a first angle within the range of 55° to 80° relative to a fitting surface plane, on which a surface of contact of the corresponding fitting flange to the impact receiving element lies whereas the heel section contiguous to such leg section has an outer face flush with the outer face of the leg section and an inside face lying at a second angle within the range of 75° to 90° relative to said fitting surface plane, the value of said first angle always being substantially less than the value of said second angle to provide a distinct heel section, and wherein the boundary between the respective inside faces of the leg and heel sections in each fender is located at a level spaced at a height within the range of 0.15 to 0.4H as measured from the fitting surface plane.

4,319,540

METHOD AND APPARATUS FOR DOCKING AND UNDOCKING IN LIGHTER-ABOARD-SHIP VESSELS OF THE FLOATER TYPE

Veikko Koskivirta, Vantaa, Finland, assignor to Valmet Oy, Finland

Filed Aug. 15, 1979, Ser. No. 66,835
Claims priority, application Finland, Aug. 21, 1978, 782553
Int. Cl.³ B63B *35/40*
U.S. Cl. 114—260 5 Claims



1. A method for facilitating the entry or docking and exit or undocking of lighters into and from the docking space of a lighter-aboard-ship vessel of the floater type and for preventing the entry of foreign objects onto the docking deck of the docking space, comprising the steps of:

during entry of the lighter into the vessel docking space through the gate thereof, the docking space having previously been filled with water in an amount sufficient to permit the lighter to float therein, drawing water out of the docking space in an amount such that a small outflow of water from the docking space in the region of the gap defined between the lighter and the docking space gate is maintained such that only a small resistance to the entry of the lighter into the docking space exists; and

during exit of the lighter from the vessel docking space through the gate thereof, the docking space having been previously emptied of water to allow loading or unloading of the lighter and then filled with water in an amount sufficient to permit the lighter to float therein, introducing water into the docking space in an amount such that a small outflow of water from the docking space in the region of the gap defined between the lighter and the docking space gate is maintained.

4,319,541

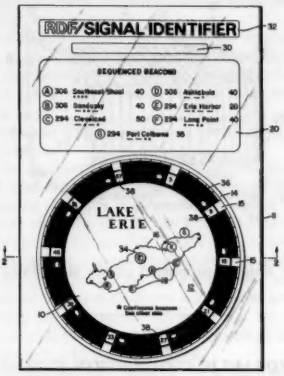
NAVIGATIONAL AID

George Sullivan, 336 Augusta Ave., DeKalb, Ill. 60115, and James Nies, 422 Logan, Geneva, Ill. 60134

Filed Apr. 28, 1980, Ser. No. 144,310
Int. Cl.³ G01S *5/08*; G09F *9/00*
U.S. Cl. 116—318 1 Claim

1. A navigational aid for determining the frequency, code, and transmission time of a selected group of radio beacons which transmit at regular short intervals, comprising, a casing having at least two spaced apart transparent portions, a data card removably positioned within said casing having two similarly spaced apart data display areas, each of said display areas being visible through one of said transparent portions of said casing, one said data display area containing the names of said beacons, their broadcast frequencies and code and identifying each of said beacons with a distinct color symbol, the other said data display area being in annular form and having a plurality of radial segments, each of said radial segments displaying a color corresponding to the color of one of said beacons and a number indicating the broadcast time for said beacon, and a disc rotatably mounted on said casing and having an annular indicator section in overlying relation with said annular data display, said indicator section having opaque and transparent sections correlated with said annular data display

area so that in any selected rotated position said transparent portions reveal all segments on said annular data display having a selected color while said opaque portions cover all other segments.

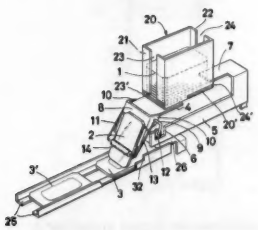


4,319,542

APPARATUS FOR PREPARATION OF BLOOD SMEAR SPECIMENS

Katsuhiro Ojima; Hajime Matsushita; Isao Fujimoto; Satosi Mizuno, and Tsuyoshi Nishida, all of Katsuta, Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Mar. 5, 1980, Ser. No. 127,470
Int. Cl.³ B05C *11/04*
U.S. Cl. 118—100 **3 Claims**



1. An apparatus for the preparation of blood smear specimens consisting of thin films of blood formed on glass slides for microscopic observation, which apparatus comprises:

a storage box for a stack of clean glass slides,

means for discharging the glass slides one by one from said storage box,

means for receiving a glass slide discharged from said storage box and setting said slide in an oblique position,

means for transferring the obliquely held glass slide to the horizontal position by rotating said slide about the lower leading edge thereof, whereby the lower edge of a subsequently discharged and obliquely held glass slide may be brought into contact with the leading edge portion of the previously discharged and horizontally held glass slide,

means for placing drop of blood sample on the glass slide in the horizontal position, and

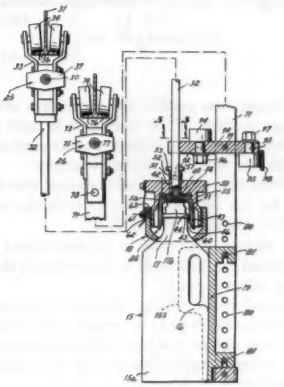
means for causing the horizontally held glass slide having the drop of blood sample retained thereon to be moved forward while keeping the upper surface thereof in contact with the lower edge of the obliquely held glass slide.

4,319,543

CONTAINER MASKING AND COATING APPARATUS

Herbert C. Shank, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Aug. 25, 1980, Ser. No. 180,650
Int. Cl.³ B05B *13/02*
U.S. Cl. 118—503 **17 Claims**



1. Apparatus for masking surface areas of containers while they are being transported through a surface treatment area wherein an outside surface portion of each container is impinged with a treatment material and another outside surface portion of each container remains untreated, which apparatus comprises

a container transport conveyor movable through said treatment area,

a plurality of hangers suspended from said conveyor,

a chuck assembly mounted upon the lower end of each hanger, each of said chuck assemblies comprising,

a chuck body,

a plurality of chuck jaws mounted by said body for movement between an outward open position and an inward closed position, said jaws when in the closed position being engageable with the finish portion of a container supported by said chuck assembly,

an annular sleeve movable along said hanger and operative to engage a surface of said jaws so as to maintain said jaws in said closed position,

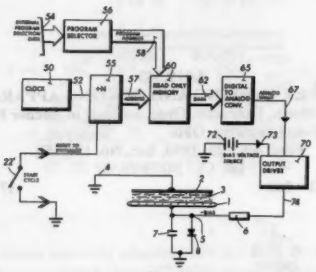
each said jaw having a lip portion engageable when in said closed position, with said finish portion of a container, so as to support said container from said jaws, and

a generally annular container neck mask supported from said chuck assembly and engageable with the neck of a container so as to prevent the neck and finish portion of said container from being treated with a treatment material as said container is transported through said treatment area while supported from said chuck assembly.

4,319,544
DIGITALLY SYNTHESIZED DYNAMIC BIAS METHOD AND APPARATUS FOR TONING CONTROL IN DEVELOPING LATENT ELECTROPHOTOGRAPHIC IMAGES

Harold J. Weber, Sherborn, Mass., assignor to Coulter Systems Corporation, Bedford, Mass.

Filed Nov. 24, 1980, Ser. No. 209,472
Int. Cl.[3] G03G 15/10
U.S. Cl. 118—647 26 Claims



1. Electric toning bias method for effecting a time related dynamic change in value of the electric field lines produced interactively between a bias electrode, a toner medium, and an electrophotographic imaging medium, whereby:

a. a first electric bias value is predetermined which is about optimum for the instant in time wherein the interactive toning effect commences;

b. a second electric bias value is predetermined which is about optimum for the instant in time wherein the interactive toning effect desists;

c. a time related rate-of-change function is predetermined which simulates the slope of the natural time related decay of the electric charge resident with the photoconductor substance comprising the essence of the electrophotograhic medium;

adaptive control of the electric toning bias value, effecting a dynamic time related change between the said first electric bias value and the second electric bias value which is momentarily about in proportion with the said slope of the said rate-of-change function.

4,319,545
SECTIONAL PET CAGE

Teho Sou, 7-18 Higashiimazato 2-chome, Higashinari-ku Osaka, Japan

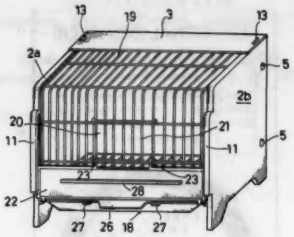
Continuation of Ser. No. 31,079, Apr. 18, 1979, abandoned. This application Dec. 24, 1980, Ser. No. 220,131
Claims priority, application Japan, Apr. 24, 1978, 53/54858; Oct. 5, 1978, 53/137613; Oct. 5, 1978, 53/137614
Int. Cl.[3] A01K 31/06
U.S. Cl. 119—17 7 Claims

1. A sectional pet cage which comprises: a frame having a pair of side plates and a back plate having means at each of the side edges thereof detachably connected with the side plates;

a covering wire net engageable with the side plates and supported thereby to cover the upper portion and the front portion of the frame, thereby forming an enclosure therein;

a curved groove along an upper and front edge of an inner face of each of the side plates for engaging side edges of the covering wire net;

a top plate detachably connected with the back plate and the side plates so as to fix the plates at a fixed position to each other; and

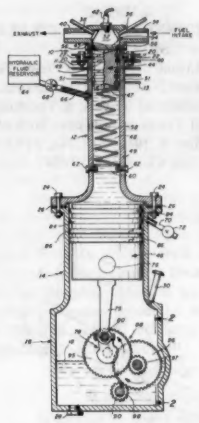


a base dish slidably supported by the side plates under the frame.

4,319,546
HYDRAULIC COMBUSTION ENGINE

Moses M. Beden, 420 Revere Beach Blvd., Revere, Mass. 02151

Filed Apr. 18, 1980, Ser. No. 141,684
Int. Cl.[3] F02B 75/32
U.S. Cl. 123—19 17 Claims



1. A hydraulic combustion engine comprising:

an engine block,

means defining a combustion chamber within the engine block,

a first piston disposed with one side facing the combustion chamber and having hydraulic seal means,

said block having means defining a cylinder chamber for slidably receiving the first piston,

said one side of said first piston having a conical recess for focusing applied explosive force for the purpose of increasing the efficiency of operation,

an open stop ring extending across said cyinder chamber above said first piston for limiting the upward motion of the first piston,

said first piston also having a bottom surface recess,

a second piston,

said block having means defining a cylinder chamber fod slidably receiving the second piston,

both said pistons being cylindrical with the first piston having a smaller diameter than the second piston,

an open support ring disposed within said block and means

locking the open support ring in a position intermediate the first and second pistons,

a hydraulic fluid contained in the engine block coupling between the pistons for force transfer from the first piston to the second piston,

means associated with the first piston for restoring the first piston to top dead center position comprising a biasing spring contacting at one end the bottom surface recess of the first piston and contacting at the other end said open support ring,

valve means and ignition means associated with the combustion chamber,

a hydraulic reservoir coupling to the engine block for coupling hydraulic fluid to the block between the piston,

said hydraulic reservoir having a fluid coupling line and said hydraulic reservoir disposed in relation to said first piston to provide fluid fill at a full height level at least as high as the hydraulic seal means associated with said first piston,

and output drive means coupled from said second piston comprising output shaft means and booster gear means for increasing rotation speed and power of the output shaft means to provide substantial enhancement of force coupled through said hydraulic fluid,

said first piston having a fluid facing surface defined as said bottom recessed surface of lesser area than a fluid facing surface of the second piston to thereby provide increased force to the second piston.

4,319,547

LIQUID-COOLED INTERNAL COMBUSTION ENGINE

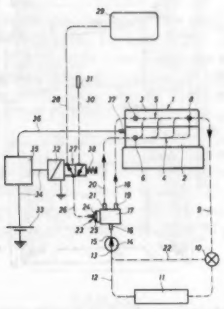
Rudolf Bierling, Eselsberg, Fed. Rep. of Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 20, 1979, Ser. No. 68,214

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1978, 2841555

Int. Cl.³ F01P 7/16

U.S. Cl. 123—41.29 **10 Claims**



1. A liquid-cooled internal combustion engine having a cylinder block and a cylinder head, each formed with an internal coolant cavity having an inlet port; a recirculating pump to which said cavities are connected; a temperature-controlled regulating device for controlling the flow of coolant through said cavities, said regulating device having an inlet which is connected to an output of the recirculating pump, a first outlet which communicates with the inlet port of the cavity in the cylinder head, and a second outlet which communicates with the inlet port of the cavity in the cylinder block, and a valve body which, depending on the temperature of the cylinder block, adopts a first position and closes the second outlet when the temperature lies below a selected value, and adopts a second position and opens said second outlet when the temperature is above this value; a low-pressure source; a pressure capsule for activating said valve body; and a temperature-controlled valve, said pressure capsule being connectable to said low-pressure source or alternatively to the atmosphere by said temperature-controlled valve.

4,319,548

INTERNAL-COMBUSTION ENGINE HAVING TWO ROWS OF CYLINDERS

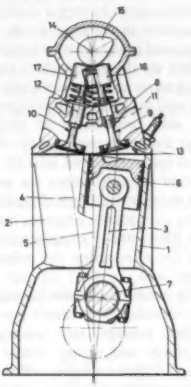
Hermann Krüger, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jul. 30, 1979, Ser. No. 62,515

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1978, 2836833

Int. Cl.³ F01L 1/04

U.S. Cl. 123—90.27 **3 Claims**

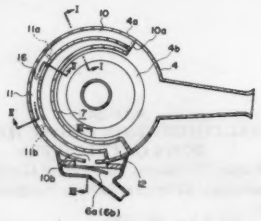


1. In an internal combustion engine including a single cylinder head, a plurality of cylinders all associated with the single cylinder head and arranged in two rows extending in the longitudinal direction of the engine with the axes of the cylinders of the two rows at respectively opposite sides of a longitudinal center plane of the engine, inlet and outlet valves arranged in two rows with each row of valves being associated with a respective row of cylinders and each valve having a longitudinal axis which extends obliquely to the longitudinal center plane of the engine, and a common camshaft carried by the single cylinder head, operatively associated with the valves and having a longitudinal axis disposed at least approximately in the longitudinal center plane of the engine, the improvement wherein: said valves are disposed and oriented in a manner such that the longitudinal axes of said valves substantially intersect the longitudinal axis of said camshaft; the longitudinal axes of said valves in one row lie in a first common plane, the longitudinal axes of said valves in the other row lie in a second common plane and the first and second common planes form an acute angle opening toward said cylinders and having its apex substantially at the longitudinal axis of said camshaft; each said common plane forms an obtuse angle with the axes of said cylinders of its associated row of cylinders; and said valves are constructed and positioned for being directly actuated by said camshaft.

4,319,549
SECONDARY AIR SUPPLY SYSTEM

Kenji Yoneda, Fujisawa; Fumio Sanezawa, Yokosuka; Yasuo Takagi, and Yuji Ushijima, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Yokohama, Japan

Filed Jun. 7, 1979, Ser. No. 46,310
Claims priority, application Japan, Jun. 16, 1978, 53-72848
Int. Cl.³ F02F *1/34*; F02B *75/10*
U.S. Cl. 123—198 E **7 Claims**



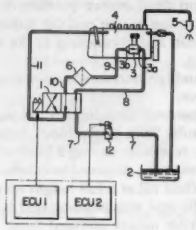
1. A secondary air supply system for use with an internal combustion engine comprising:
- an engine air filter for filtering intake air to be inducted to the engine, said air filter having a casing;
- a reed valve operative in response to the exhaust pressure pulsations generated in the exhaust system of the engine to induct secondary air therethrough to the exhaust system;
- means for defining an air induction passage inside said casing of said engine, said air induction passage being in communication with said reed valve so that air is inducted through said air induction passage into the exhaust system upon opening of said reed valve, said air induction passage comprising a first silencer means for attenuating the exhaust noises in medium and high frequency ranges;
- means for defining a resonance chamber inside said casing of said engine air filter, which chamber comprises a second silencer means for attenuating the exhaust noises in low frequency range; and
- means for defining a communication passage through which said resonance chamber is in direct communication with said air induction passage, said communication passage being located inside said casing of said engine air filter, said air induction defining means, said resonance chamber and said communication passage include an integrally formed member which is detachably disposed interior of and along the inner wall surface of the casing of said engine air filter.

4,319,550
ENGINE STOP APPARATUS

Yoshiya Ishii, Toyota; Nobuyuki Fujitani, Kariya, and Hidetoshi Dohshita, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 22, 1980, Ser. No. 142,818
Claims priority, application Japan, May 11, 1979, 54-58539
Int. Cl.³ F02D *17/00*
U.S. Cl. 123—198 DB **8 Claims**

1. An apparatus for stopping an engine having a fuel supply pump, a fuel injection pump and a fuel tank, comprising:
- an electromagnetic selector valve for connecting, when deenergized, a pipe line from said fuel tank to an inlet of said fuel supply pump and an outlet of said fuel supply pump to a pipe line from said fuel injection pump and for connecting, when energized, said pipe line from said fuel injection pump to said fuel supply pump inlet and said fuel supply pump outlet to said pipe line from said fuel tank;
- electromagnetic valve means disposed in at least one of said pipe line from said fuel tank and said pipe line from said fuel injection pump so as to open and close a passageway therein, said valve means being adapted such that only the flow of fuel from said fuel injection pump to said fuel tank is allowed when said valve means is closed;
- a first energization control unit connected to said electromagnetic selector valve and responsive to an on-to-off transition of a key switch of said engine to energize said

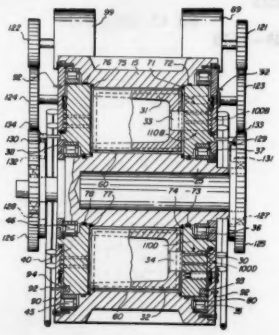


electromagnetic selector valve for a predetermined time interval; and
- a second energization control unit connected to said valve means to open the same while said engine key switch is turned on.

4,319,551
ROTARY INTERNAL COMBUSTION ENGINE

Bernard Rubinshtein, 215 Blueberry La., Apt. C, Thousand Oaks, Calif. 91360

Continuation-in-part of Ser. No. 9,774, Feb. 6, 1979, abandoned. This application Mar. 7, 1980, Ser. No. 128,091
Int. Cl.³ F02B *53/00*
U.S. Cl. 123—245 **18 Claims**



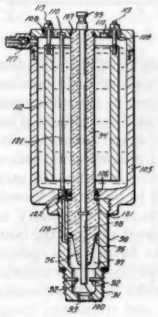
1. A rotary internal combustion engine comprising:
- a housing;
- a shaft journaled in the housing such that one of the shaft and the housing is free to rotate with respect to the other;
- a pair of carrying walls mounted on the shaft within the housing, the carrying walls being positioned with respect to the housing and the shaft so as to define a toroidal operating chamber between them;
- at least one piston carried by each carrying wall, so that the operating chamber is divided into discrete working chambers by the pistons;
- outer one way clutch means through which the carrying walls are operatively mounted with respect to the housing, the outer one way clutch means being oriented so as to permit both of the carrying walls to rotate only in one given direction with respect to the housing;
- inner one way clutch means through which the carrying walls are operatively mounted with respect to the shaft, the inner one way clutch means being oriented so as to

permit the shaft to rotate in the same given direction with respect to the carrying walls;
intake means for providing fuel and air to each of the work chambers;
means for igniting the fuel in each of the work chambers;
exhaust means for venting the combustion products from each of the work chambers; and
timing means for controlling the intake means, the means for igniting the fuel, and the exhaust means solely as a function of the relative position of the carrying walls to each other.

4,319,552
PRE-COMBUSTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Fred N. Sauer, 454 Hammersmith Rd., and J. Brian Barry, 12872 Conway Rd., both of St. Louis, Mo. 63141

Filed Mar. 3, 1980, Ser. No. 126,386
Int. Cl.³ F02B *19/10*
U.S. Cl. 123—297 **15 Claims**



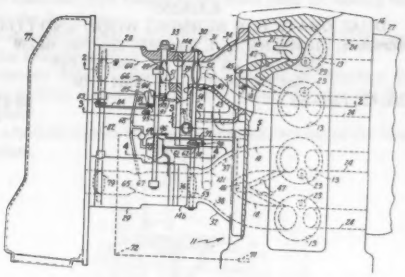
1. In an arrangement for supplying two gases to an internal combustion engine that may explode when united, without combining them at a distance from the point of combustion, thereby to reduce the hazard of explosive pre-combining of the gases: spark means comprising a body shell having means to mount it on the cylinder of the engine, means associated with the shell providing sealed electrodes to give a spark for ignition; means in said body shell to supply a first pre-combustion gas therein, means in said body shell to supply a second pre-combustion gas therein, and means in said body shell to combine said gases and dispose said combined gases adjacent the electrodes, and means to prevent backflow of gases from the shell.

4,319,553
INDUCTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yoshinori Endo, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 12, 1979, Ser. No. 57,096
Claims priority, application Japan, Jul. 14, 1978, 53-85223
Int. Cl.³ F02M *13/04*
U.S. Cl. 123—432 **11 Claims**

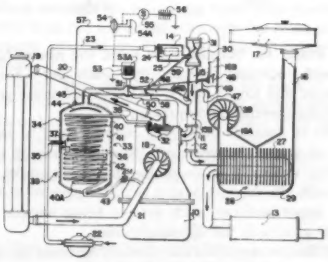
1. An induction system for an internal combustion engine having at least one variable volume chamber in which combustion occurs comprising a main induction passage for delivering a charge to said chamber, an auxiliary induction passage for delivering a charge to said chamber, said auxiliary induction passage having a substantially lesser cross sectional area than said main induction passage whereby a given mass flow of charge through said auxiliary induction passage will enter said chamber at a substantially greater velocity than the same mass flow through said main induction passage and throttle valve means for controlling the proportion of flow to said chamber through said induction passages, said throttle valve means comprising a manually operated throttle valve in said main induction passage for controlling at least a portion of the total mass flow to said chamber, said auxiliary induction passage having its inlet in communication with said main induction passage downstream of said manually operated throttle valve, and a secondary throttle valve in said main induction passage downstream of said auxiliary induction passage inlet for controlling the flow through at least one of said induction passages, the improvement comprising means for controlling the position of said secondary throttle valve in response to a flow condition of said induction system and means for overriding the flow condition responsive means for opening said secondary throttle valve regardless of said flow condition when said manually operated throttle valve is opened faster than the flow condition changes.



4,319,554
FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Albert E. Buffie, 6 Gatineau Bay, Winnipeg, Manitoba, Canada (R2J 1T8)

Filed Jun. 23, 1980, Ser. No. 161,910
Int. Cl.³ F02B *33/00*; F02D *23/00*; F02M *13/00*
U.S. Cl. 123—559 **24 Claims**



1. In a carburation system for internal combustion engines which include an air intake and an inlet manifold, a carburetor operatively connected thereto, a supply of fuel, an exhaust system, a coolant system including a radiator and a thermostat operatively controlling the flow of coolant to and from said radiator; the improvement comprising in combination:
(a) means for compressing the air from said air intake,
(b) means to preheat said air by said exhaust system,
(c) a fuel vaporizing unit operatively connected to the supply of fuel,
(d) means to operatively connect said coolant system with said fuel vaporizing unit to vaporize fuel within said unit when said coolant reaches a predetermined temperature,
(e) means to operatively connect said fuel vaporizing unit

with said inlet manifold when a predetermined pressure of vapor is generated within said unit and

(f) means to by-pass the carburetor and route the preheated and compressed air from said air intake to said inlet manifold and to mix same with the fuel vapor from said unit.

4,319,555

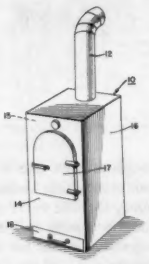
DUAL GRATE FOR BURNING WOOD AND COAL

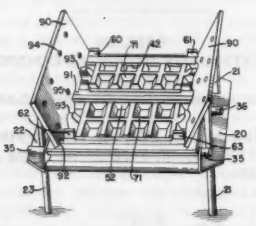
Morton A. Melvin, R.F.D. 1, Box 38D, Jay, Me. 04239

Filed Nov. 24, 1980, Ser. No. 209,918

Int. Cl.³ F24C *1/00*; F23H *7/08*

U.S. Cl. 126—60 **10 Claims**





1. In a heater for burning solid fuels, the heater having a housing with enclosing side and rear walls and a front wall having upper and lower doors; an improved grate structure and mounting therefore, comprising:

(a) a pair of opposed horizontal runners fixed to said sidewalls at a level between said doors and having rods extending vertically through the runners parallel to the sidewalls, the runners having multiple pairs of grooves in their upper surfaces, each groove being aligned with a similar groove in the opposite runner;

(b) grate frames supported horizontally between the runners, and having lugs supported in and located by said grooves, each grate frame having a shaker-grid opening therein and having opposed bearing holes located adjacent to said runners;

(c) a shaker grid in each frame, each shaker grid having oppositely extending pintles resting in the bearing holes of a frame, and having ash supporting fingers extending horizontally at right angles to said pintles toward the frame, and each grid having a shaker yoke extending at right angles to the fingers for rocking the grid about said pintles; and

(d) a pair of sideliner plates, each extending substantially the length of a runner, the plates being supported on the frames and leaning against the rods and diverging upwardly toward the sidewalls.

4,319,556

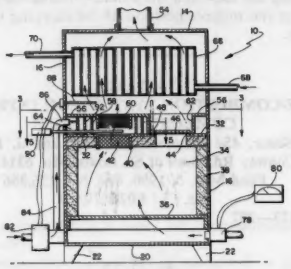
CATALYTIC STOVE

Larry A. Schwartz, Warwick; Robert Geiter, Coventry, and Peter S. Albertsen, Quidnesset, all of R.I., assignors to Jamestown Group, Providence, R.I.

Filed Mar. 9, 1981, Ser. No. 241,703

Int. Cl.³ F24C *1/14*; F23J *15/00*

U.S. Cl. 126—77 **13 Claims**



1. A stove comprising front, rear, top, bottom and side walls, a door on said front wall movable between closed and open positions to permit access to the stove interior, a substantially horizontal partition in said stove located intermediate said top and bottom walls, the space between said partition and said bottom wall defining a primary combustion chamber, support means located adjacent the bottom of said primary chamber for supporting the fuel to be burned therein, first draft means for controlling introduction of primary air to said primary chamber and being located adjacent the bottom of said primary chamber, said partition having two openings therein, a catalytic converter mounted on said partition in registry with one of said openings whereby all gases passing through said one opening pass through said converter, damper means movable between a first position normally completely covering said other opening and a second position wherein said other opening is unblocked, handle means operable from outside the stove to move said damper between said first and second positions, said handle means blocking opening movement of said door when said damper is in its said first position, whereby said door can be opened only when said damper has been moved to its said second position, second draft means for controlling the introduction of secondary air to said stove at a location adjacent said partition, said second draft means being located adjacent the bottom of said primary chamber, and an exhaust duct communicating with said stove at a location above said partition.

4,319,557

HEAT EXCHANGER FURNACE

Vernon H. Sietmann, Laurel, Iowa 50141; Steven C. Stockdale, and Elmer G. Stockdale, both of Rte. #3, Iowa Falls, Iowa 50126

Filed Aug. 8, 1980, Ser. No. 176,409

Int. Cl.³ F24H *3/02*; F23H *11/10*; F24B *7/00*

U.S. Cl. 126—110 R **5 Claims**

1. A heat exchanger furnace, comprising,

a firebox,

a heat exchanger housing in communication with said firebox for receiving combustion gases therefrom, said housing being at least partially defined by at least one upright sidewall,

a plenum housing surrounding said heat exchanger housing and spaced therefrom to define a plenum chamber therebetween,

a plurality of baffles having outer peripheral edges,

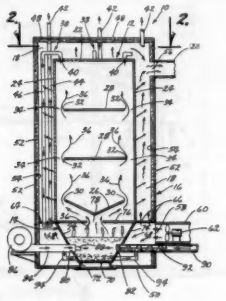
means for supporting said baffles generally centrally of said heat exchanger housing in vertically spaced apart and generally horiztonally extended relation therein,

said baffles being of a size and shape to substantially fill the horizontal cross section of said heat exchanger housing and to define openings between said peripheral edges of said baffles and the heat exchanger housing whereby hot combustion gases rising within said heat exchanger housing are directed outwardly adjacent said sidewall,

said plenum chamber including air inlet and outlet openings arranged in vertically spaced apart relation and further comprising forced air circulation means associated with said plenum chamber for forced air flow into said inlet opening, through said plenum chamber and out said outlet opening,

said forced air circulation means including a fan, and further comprising means for supporting said fan adjacent said inlet opening and a baffle means in said plenum chamber between said inlet and outlet openings for distributing airflow throughout said plenum chamber,

said baffle means comprising a member which substantially blocks the horizontal cross-section of said plenum chamber, said member including a plurality of openings generally uniformly spaced apart about said member,



at least one exhaust pipe in communication with an upper portion of said heat exchanger housing, said exhaust pipe extending outwardly of said plenum housing for exhausting combustion gases, and said exhaust pipe including a generally U-shaped portion having a first leg extended downwardly into said plenum chamber and a second leg extended upwardly and outwardly of said plenum chamber for persenting additional heat exchange surfaces within said plenum chamber, and

an air inlet passage in communication at one end with said firebox, means for supplying air under pressure to said firebox through said air inlet passage, a fuel inlet passage in communication at one end with said firebox, means for supplying fuel to said firebox through said fuel inlet passage, and means establishing communication between said air inlet passage and fuel inlet passage whereby air introduced into said fuel inlet passage under pressure is operative to prevent the escape of combustion gases from said firebox through said fuel inlet passage.

4,319,558

FIREPLACE HEATER

Carl C. Thurlo, P.O. Box 386, Kingston, Okla. 73439

Filed Mar. 27, 1980, Ser. No. 134,487

Int. Cl.³ F24B *7/00*

U.S. Cl. 126—121 **5 Claims**

1. A heater adapted to be inserted into a fireplace having

a. a front,

b. a front opening in the front,

c. a lintel over the opening, and

d. a hearth below the opening, wherein the improved heater comprises:

e. a front plate having a top and bottom,

f. lintel clamp means on the top of the front plate for clamping same to the fireplace lintel,

g. heat exchange tubes rigidly attached to the front plate and adapted to extend into a fireplace,

h. leveling screw means on the tubes spaced away from the front plate for raising the tubes and forcing the bottom of the front plate against the front of the fireplace,

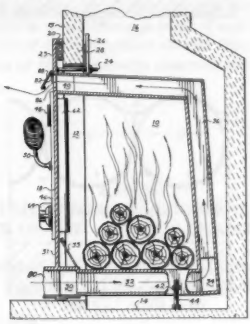
i. heat resistant seal means between the front plate and fireplace front for keeping air from leaking into the fireplace,

j. at least one door hinged to the front plate for adding fuel to the fireplace,

k. heat resistant seal means between the door and front plate for keeping air from leaking into the fireplace,

l. damper means located at the front of the fireplace for permitting a controlled amount of air to enter the fireplace,

m. a bottom header attached to the back bottom of the front plate,



n. two tubes fluidly connected to the bottom header extending to a rear header,

o. three tubes extending from the rear header to a top header, thereby

p. forming an air passage way from the bottom header to the top header,

q. said tubes forming a rigid structure,

r. orifices through the top of the front plate forming an air outlet from the top header through the front plate,

s. a shield attached to the front plate extending over the orifices,

t. an embers heat shield attached to the back of the front plate below the doors and extending downward over the bottom header to shield the front plate from hot embers and radiation within the fireplace, and

u. door heat shields on back of the doors to shield the doors from radiant heat within the fireplace.

4,319,559

SOLAR COLLECTOR FOR HEATING A GASEOUS HEAT TRANSPORT MEDIUM

Wilhelm Hermann, and Horst Hörster, both of Roetgen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,827

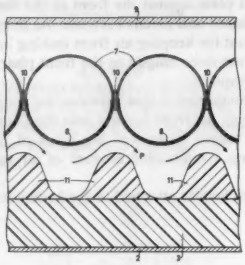
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1979, 2913360

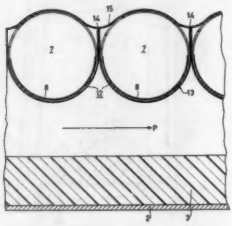
Int. Cl.³ F24J *3/02;* **F28F** *13/00*

U.S. Cl. 126—442 **4 Claims**

1. A solar collector for heating a gaseous heat transport medium, which comprises a thermally insulated open-top housing having a bottom, oppositely disposed endwalls, and oppositely disposed sidewalls; a transparent cover layer formed of a plurality of adjacently arranged, substantially mutually contacting, sealed and evacuated transparent cover tubes spaced from the housing bottom and positioned substan-

tially parallel to the sidewalls, the inner surface of each cover tube being provided with a selective absorption layer over the half facing the interior of the housing, the surface of the housing bottom facing the cover tubes having a vaulted profile corresponding to the shape of the cover tubes; and an inlet and an outlet respectively provided in the sidewalls for flow of the





gaseous heat transport medium transversely of the cover tubes in direct thermal contact therewith, wherein said solar collector includes elongate, interconnected bag means formed of a transparent foil material for respectively accommodating the cover tubes, said foil material also being connected to the sidewalls of the housing.

4,319,560

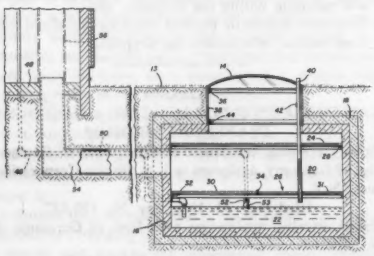
SOLAR HEATING SYSTEM

Roy L. Hall, Rte. One, Frankfort, Ky. 40601

Filed Sep. 9, 1980, Ser. No. 185,624

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—450 **7 Claims**



1. A solar heating system for supplying heated air and water for use in a building, said system comprising an enclosed storage tank positioned below ground level, a magnifying glass to direct and concentrate solar radiation to said storage tank positioned adjacent to and above ground level, said storage tank comprising an air storage portion fully below ground level and a water storage portion below said air storage portion, said air storage portion and said water storage portion comprising hollow regions formed by said storage tank and containing the respective fluids, said water storage portion comprising an inlet and an outlet communicating with the interior of said building for circulation and use of heated water in said building and said air storage portion comprising an inlet and outlet communicating with the interior of said building for circulation and use of heated air, said water storage portion being separated from said air storage portion by means of a transparent baffle, said magnifying glass being separated from said air storage portion by a transparent baffle, and said storage tank being covered substantially with a thermal insulating layer.

4,319,561

SOLAR ENERGY COLLECTOR ASSEMBLY

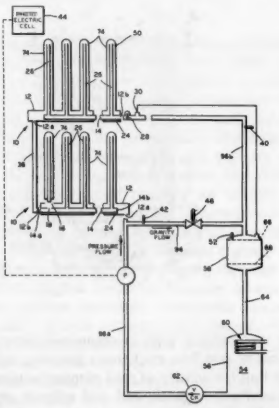
Yu K. Pei, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 127,705, Mar. 6, 1980, Pat. No. 4,282,857.

This application Apr. 24, 1981, Ser. No. 256,885

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—452 **3 Claims**



1. A process for the collection of solar energy via a heat-exchangeable fluid, in a batch mode system during daylight hours with complete shutdown during nighttime hours, said process comprising:

(a) initiating the system at daybreak via a photo-electric cell to activate a pump to transfer cold fluid from a holding tank to a manifold assembly;

(b) transferring said cold fluid under pressure in one direction through a manifold assembly to fill a tier of a plurality of tubular collectors, in parallel, and subsequently to fill a plurality of tiers of tubular collectors, in series;

(c) sensing said cold fluid flow exiting from said last tier to deactivate said pump and to localize said cold fluid in the collectors and the manifold assembly;

(d) allowing said cold fluid to be heated to a predetermined temperature by the sun;

(e) activating a valve means upon reaching the predetermined temperature to open a conduit from the first tier;

(f) draining said heated fluid, under gravity, from the collectors and manifold assembly via the conduit from the first tier to a displacement tank in series with the holding tank, so that said heated fluid will enter and stratify in the upper portion of said tank;

(g) sensing lack of flow of said heated fluid in said conduit, to deactivate and close said valve means in said conduit and to reactivate said pump to again transfer cold fluid from the holding tank to the manifold assembly and the collectors for another cycle of heating;

(h) sensing over-temperature and over-pressure conditions to protect the system from boil-out conditions; and

(i) closing the system at nightfall via said photo-electric cell, to completely drain said fluid from the manifold assembly and the collectors, via the conduit from the first tier to the displacement tank and subsequently to said fluid tank,

whereby said process provides a batching system for controllably exchanging solar energy for heat energy and provides a fail safe system relative to freeze conditions and boil-out conditions.

4,319,562

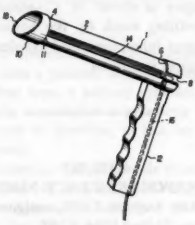
METHOD AND APPARATUS FOR PERMANENT EPICARDIAL PACING OR DRAINAGE OF PERICARDIAL FLUID AND PERICARDIAL BIOPSY

Ivan K. Crosby, Charlottesville, Va., assignor to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Division of Ser. No. 865,173, Dec. 28, 1977, Pat. No. 4,181,123. This application Jul. 27, 1979, Ser. No. 61,408

Int. Cl.³ A61B *19/00*

U.S. Cl. 128—1 R **1 Claim**



1. A surgical method of drainage of pericardial fluid and pericardial biopsy, comprising:

making a key hole incision below the xiphoid process of a body;

introducing a pericardioscope through said key hole incision into a retrosternal space of said body; and

performing pericardial biopsy by excising a disc of the pericardium, so as to allow for drainage of the pericardial fluid, entrance of the pericardioscope into the pericardial cavity, inspection of the epicardial surface of the heart and evaluation of the pericardium itself.

4,319,563

ENDOSCOPE WITH A SMOOTHLY CURVED DISTAL END FACE

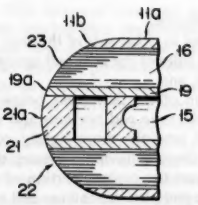
Tetsumaru Kubota, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 30, 1979, Ser. No. 43,828

Claims priority, application Japan, Dec. 2, 1977, 52-162018

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—6 **3 Claims**



1. An endoscope of the direct-viewing type comprising:

a rigid elongated outer sheath having a distal end to be inserted into a body cavity, said distal end having a distal end face;

an observation system longitudinally disposed inside said sheath for essentially the entire length of said sheath and having one end portion connected to a view window located in the distal end of said outer sheath, said view window having a smooth outer glass face disposed along the longitudinal centerline of said sheath in the center of the distal end face;

a plurality of light conducting optical fibers longitudinally arranged inside said outer sheath, said fibers having distal ends concentrically surrounding said view window, said fiber distal ends forming a portion of said distal end face and being ground to form an annular convexedly spherical distal end portion which forms a single continuous surface with said view window, said fiber distal ends being ground so that said annular convexedly spherical distal end portion is shaped to have a curvature which directs light from said fiber distal ends towards said view window so that light directed through some of said fibers overlaps light directed through others of said fibers to illuminate the region of the body cavity observed through said view window.

4,319,564

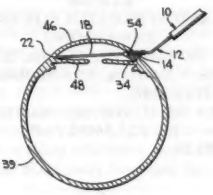
INSTRUMENT FOR MEASUREMENT OF THE DIAMETER OF THE ANTERIOR CHAMBER OF THE EYE

John R. Karickhoff, 8615 Crestview Dr., Fairfax, Va. 22046

Filed Jan. 3, 1980, Ser. No. 109,318

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—774 **12 Claims**



1. An instrument for measurement of the diameter of the anterior chamber of the human eye comprising

an elongate member of a size so as to be adapted to be inserted into the anterior chamber of a human eye through an incision in the cornea adjacent but spaced from the iris, said elongate member having a proximal portion and a distal end having a contact edge adapted to be positioned against the juncture of the iris and the cornea opposite the incision;

a slide mounted on said elongate member for movement therealong having a body engaging said elongate member and an arm depending therefrom and extending away from said distal end of said elongate member along said body of said slide to a contact edge, said arm having a flattened dimension defining a plane including said contact edge, said plane extending at an acute angle with said proximal portion of said elongate member;

first indicia means carried on said slide; and

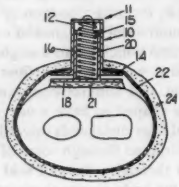
second indicia means carried on said proximal portion of said elongate member whereby movement of said slide to position the end of said arm of said slide against the juncture of the iris and the cornea adjacent the incision causes relative movement of said first and second indicia means to indicate the diameter of the anterior chamber.

4,319,565

DEVICE FOR INCLUSION IN AN IMMOBILIZING STRUCTURE FOR A LIMB AND LIMB IMMOBILIZING STRUCTURES INCLUDING SUCH DEVICES

Derek J. W. McMinn, 14 Avon Dr., Moseley, Birmingham 13, England

Filed Apr. 21, 1980, Ser. No. 142,413
Claims priority, application United Kingdom, Apr. 24, 1979, 14252/79
Int. Cl.³ A61F 5/04
U.S. Cl. 128—87 R 7 Claims



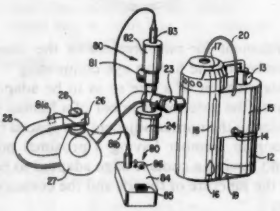
1. A device for incorporation in a splint for a limb, said device comprising a rigid first part which includes locating means for engaging a recess in said splint so as to prevent rotation of said first part within the recess, said first part also including means for restraining linear movement of the first part away from a limb within the splint, a rigid second part for engaging a limb within the splint, said second part being slidably engageable with said first part, means for preventing relative rotation between said parts, and a spring engageable with said parts for biasing said second part into contact with a limb within said splint.

4,319,566

METHOD AND APPARATUS FOR INHALATION REWARMING

John Hayward, 570 Linnet La., Victoria, B.C., Canada (V8X 3X1), and Robert Douwens, 2924 Shelbourne St., Victoria, B.C., Canada (V8R 4M6)

Filed Jul. 21, 1980, Ser. No. 170,536
Int. Cl.³ A61M 16/00
U.S. Cl. 128—203.26 28 Claims



1. Apparatus for inhalation rewarming for the treatment of victims of hypothermia, comprising:

(a) a water reservoir;

(b) a steam chamber communicating with said water reservoir;

(c) a heater means, associated with said water chamber, for the generation of steam into said steam chamber;

(d) means for admitting air to said steam chamber, thereby to provide an air-steam mixture;

(e) first conductor means having inlet means connected to said steam chamber for the conducting of said air-steam mixture from said steam chamber in a first direction and having outlet means;

(f) valve means in said first conductor means communicating with ambient air for varying the inflow of said ambient air into said conductor means while simultaneously reciprocally varying the inflow of said air-steam mixture from said steam chamber into said conductor means and providing a substantially constant volume flow from said first conductor means, said valve means including actuated operator means for initially introducing sufficient ambient air into said air-steam mixture in said first conductor means to provide a constant volume flow of water-saturated air at a temperature of about 35° C.–about 45° C. and for maintaining said constant volume flow of said water-saturated air at said temperature of about 35° C.–about 45° C.;

(g) flexible conduit means connected to said outlet means of said first conductor means leading from said valve means for conducting said water-saturated air in said first direction; and

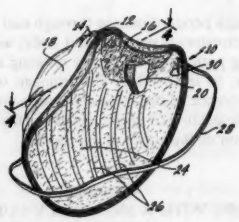
(h) a breathing mask connected to said flexible conduit means downstream of said valve means, said breathing mask including one-way valves therein to permit said water-saturated air to flow only in said first direction to said breathing mask, whereby said water-saturated air at said temperature of about 35° C.–about 45° C. is drawn into said breathing mask by the negative pressure produced by human inhalation, and exhaled air produced by human inhalation is vented.

4,319,567

DISPOSABLE FACE MASK

Mark Magidson, Los Angeles, Calif., assignor to Moldex/Metric Products, Inc., Culver City, Calif.

Filed Jul. 7, 1980, Ser. No. 166,315
Int. Cl.³ A62B 7/10
U.S. Cl. 128—206.19 19 Claims



1. A face mask formed by a blank piece of material composed of a plurality of fibers having a substantially constant thickness throughout and di-molded into a generally cup-shaped configuration to fit over the mouth and nose of a wearer and for filtering the air passing through the fibers, including,

a nose bridge portion,

nose pad portions to either side of the nose bridge portion to fit against the sides of the nose and against the cheekbones of the wearer, and

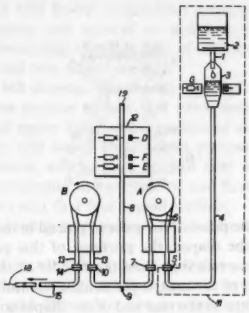
a central portion of the face mask below the nose bridge portion and the nose pad portions and with the fibers of the nose pad portions more lightly compacted during molding and thereby having a greater thickness than the fibers in at least the central portion of the face mask to have the nose pad portions thicker and more flexible than at least the central portion of the face mask for providing a seal against the sides of the nose and the cheekbones for preventing the passage of air between the mask and the face of the wearer.

4,319,568

LIQUID DISPENSING APPARATUS

John A. Tregoning, Reading, England, assignor to Vickers Limited, London, England

Filed Oct. 29, 1979, Ser. No. 88,812
Int. Cl.[3] A61M 5/00
U.S. Cl. 128—214 F 8 Claims



1. Apparatus for dispensing a predetermined quantity of liquid for infusion into a patient, which apparatus comprises a T-tube having a first arm, a second arm and a limb tube, of which the limb tube constitutes a reservoir for liquid and is closed at its free end to provide, in use, an air space above liquid in the reservoir;

a first tube connected at one of its ends to said first arm of the T-tube and made of resiliently deformable material to enable the passage within said first tube to be closed at least partially, the other of the ends of said first tube being adapted for connection to a drip set containing the liquid which is to be infused into the patient;

a second tube made of a material having the same deformation property as said first tube and connected at one of its ends to said second arm of the T-tube and the other of its ends being adapted for connection to an infusion needle;

a first peristaltic pump operative to exert a pumping action on said first tube;

a first level detector external of and adjacent to said reservoir, and arranged to render said first peristaltic pump inoperative once liquid has been pumped into the reservoir to a predetermined datum level;

a second peristaltic pump operative to exert a pumping action on said second tube;

a second level detector external of and adjacent to said reservoir, and arranged to render said second peristaltic pump inoperative when liquid in the reservoir has fallen from said datum level to a predetermined lower level; and

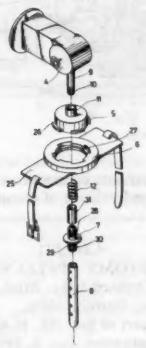
control means arranged to control operation of said first and second peristaltic pumps cyclically such that, when said first tube is connected to said drip set and said second tube is connected to said infusion needle, operation of said first pump causes liquid from the drip set to be pumped through said first tube and into said reservoir until the level of liquid reaches said predetermined datum level whereupon said first level detector actuates the control means to render said first peristaltic pump inoperative and simultaneously to commence operation of said second peristaltic pump; and operation of said second peristaltic pump causes liquid to be pumped out of the reservoir through said second tube and thence to the infusion needle until the level of liquid in the reservoir reaches said predetermined lower level, whereupon said second level detector actuates the control means to render said second peristaltic pump inoperative and to restart operation of said first peristaltic pump, whereby a predetermined quantity of liquid is dispensed from the infusion needle at regular intervals.

4,319,569

FASTER IRRIGATION SET FOR CONTROLLING COLOSTOMY

Hsueh-Shun Hu, 4th Fl., No. 16, Lane 220, Section 2, Hsin-Lung Rd., Taipei, Taiwan

Filed Jan. 28, 1980, Ser. No. 116,153
Int. Cl.[3] A61M 3/00
U.S. Cl. 128—241 12 Claims



1. An irrigation set for a colostomy patient comprising an irrigating solution container and a catheter, means for controlling the speed of irrigating solution from said container to said catheter, means for effecting suction of excrement through said catheter, means for fixing said catheter and tightening around the stoma, and means for regulating the flowing direction either for irrigating solution or drawing the excrement off,

wherein said means for fixing the catheter and tightening around the stoma comprises a cap having a flange, a face plate belt having an apertured face plate with an inner ring for mating with said cap, and a stoma plate having a tube protruding from one side thereof; the flange of the said cap and the inner ring edge of the said face plate having corresponding protrusions and recesses for said mating; said stoma plate being connected to said cap and face plate with said protruding tube of the said stoma plate therebetween, said protruding tube being sleeved with a spring to urge said stoma plate away from said face plate.

4,319,570

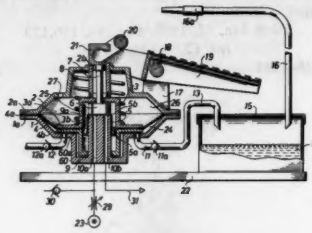
TRACHEAL SUCTION PUMP DESIGNED PRIMARILY FOR ASPIRATION PURPOSES

Christian Grane, Kokedal, Denmark, assignor to Ruth Lea Hesse, Rungsted Kyst, Denmark

Continuation of Ser. No. 851,282, Nov. 14, 1977, abandoned. This application Jan. 29, 1981, Ser. No. 230,101
Claims priority, application United Kingdom, Nov. 12, 1976, 47335/76
Int. Cl.[3] A61M 1/00
U.S. Cl. 128—278 12 Claims

1. A suction pump comprising a pump assembly having a suction chamber of variable volume with an outlet leading to the ambient atmosphere and an inlet communicating with a secretion-receiving reservoir with attached tubing permitting suction of secretion, primarily from the air ducts of an unconscious patient, said pump being characterized by the pump assembly comprising a housing enclosing the suction chamber and closed at one end by means comprising a first annular diaphragm forming a boundary between the suction chamber and the atmosphere, and a rigid body centrally sealingly attached to said first annular diaphragm and guided by means connected to said housing for movement relative to the housing and having wall portions defining, together with means forming part of the housing, a motor chamber of variable

volume delimited from said suction chamber by a second annular diaphragm, said motor chamber communicating with driving gas supply and exhaust connections and a valve arrangement for the intake and exhaust of compressed driving gas.



4,319,571
OSTOMY APPLIANCE

Frank J. Winchell, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 16,428, Mar. 1, 1979, abandoned. This application Aug. 4, 1980, Ser. No. 174,914
Int. Cl.³ A61F *5/44*
U.S. Cl. 128—283 **9 Claims**

3. An ostomy appliance for collecting body wastes emitted from a stoma in the abdomen comprising;

a waste collection pouch formed in apron style having an upper portion wide enough to extend entirely across the abdomen of the user and a contiguous generally V-shaped lower portion containing discharge means, the upper portion having an opening to receive wastes discharged from the stoma into the pouch, the upper portion having upper corners widely spaced for location at opposite sides of the user's abdomen,

a belt attached to the widely spaced upper corners for supporting the pouch and its contents,

a generally toroidal O-ring formed of compliant material for seating in sealing relationship on the abdomen surrounding the stoma,

a centrally apertured annular sealing means secured to the pouch around the said opening and seated in sealing engagement with the O-ring so that wastes from the stoma pass through the O-ring and sealing means into the pouch opening, and means for fastening the sealing means to the belt to urge the sealing means and the O-ring toward the abdomen.

4,319,572
DISPOSABLE DIAPER

Leif U. R. Widlund, Mölnlycke, and Maj I. Ternström, Gothenburg, both of Sweden, assignors to Mölnlycke AB, Gothenburg, Sweden

Filed Jun. 24, 1980, Ser. No. 162,678
Claims priority, application Sweden, Jul. 2, 1979, 7905765
Int. Cl.³ A61F *13/16*
U.S. Cl. 128—284 **9 Claims**

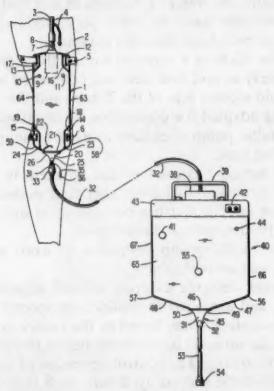
1. In a disposable diaper with an adsorbent body, which is placed inside a casing made with a crotch portion, said casing comprising a first layer of a liquid-permeable material, intended to lie in contact with the body of the user and a second layer of a liquid-impermeable material, between which two layers the absorbent body is arranged and which extend at least laterally outside the edges of the absorbent body; the improvement in which the layers, in a direction towards the rear end of the diaper and beginning at the crotch portion, extend laterally outside said edges with a continuously increasing distance from the same, thereby forming flaps with gradually increasing width on both sides of the absorbent body, and at least one pretensioned elastic means arranged in an essentially V-shaped

pattern with the point of the pattern placed in the middle of the front end of the diaper, the portions of this pattern running from the point extending from the middle of the front diaper end to the end of the crotch portion and continuing along the edges of the flaps to the rear end of the diaper so that when the diaper is used the flaps will be in tight contact against the bottom of the user.

4,319,573
PERSONAL LIQUID REMOVAL SYSTEM

Norris W. Whitlock, 105 Creekside Ct., Greer, S.C. 29651

Filed Feb. 22, 1980, Ser. No. 123,666
Int. Cl.³ A61M *1/00*
U.S. Cl. 128—295 **29 Claims**



1. A device, adapted to be secured to a person, for storing liquid material being removed from said person by a tube comprising:

(a) a first storage container which is secured to said person and is operative to hold said liquid material;

(b) a first valve means secured in the lower longitudinal portion of said first storage container, said first valve means comprising:

(1) a first upper closure piece secured in the upper longitudinal portion of said first valve means;

(2) a first front funnel surface, extending from said upper longitudinal portion of said first valve means to the lower longitudinal portion of said first valve means, and secured to said first upper closure piece, which is basically flat when said first valve means is closed and forms a sloping side when said first valve means is open;

(3) a first rear funnel surface, extending from said upper

longitudinal portion of said first valve means to said lower longitudinal portion of said first valve means, and secured to said first upper closure piece, which is basically flat when said first valve means is closed and forms a sloping side when said first valve means is open;

(4) a first right sloping funnel edge, secured onto the right transverse portion of said first valve means extending from said upper longitudinal portion of said first valve means to said lower longitudinal portion of said first valve means, and secured to said first upper closure piece, connecting the right side of said first funnel surface to said rear funnel surface;

(5) a first left sloping funnel edge, secured onto the left transverse portion of said first valve means extending from said upper longitudinal portion of said first valve means to said lower longitudinal portion of said first valve means, and secured to said first upper closure piece, connecting the left side of said first front funnel surface to said first rear funnel surface;

(c) a first connecting means secured to said first valve means; and

(d) a first connector tubing secured within said first valve means and extending out from said lower longitudinal portion of said first valve means wherein said first connecting means is secured around said first connector tubing.

4,319,574

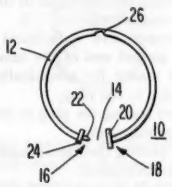
ACUPRESSURE DEVICE

Evelyn L. Sun, Cynwyd, and Robert J. Sun, Easton, both of Pa., assignors to Suntex Products, Inc., Easton, Pa.

Continuation of Ser. No. 897,278, Apr. 17, 1978, abandoned. This application May 23, 1980, Ser. No. 152,551

Int. Cl.³ A61H *39/04*

U.S. Cl. 128—303 R **11 Claims**



1. A device for treating physiological disorders of the human body by pressure, said device comprising:

a mounting having two clamping members movable with respect to one another for clamping a selected portion of the external ear therebetween, one of said members having a shoulder portion with a rigid projection extending therefrom, said projection terminating in a blunt planar surface having a surface area less than 3 mm^2, the shoulder portion located relative to said projection so as to preclude penetration of the skin by said projection, the length of said projection being greater than 1 mm, whereby said surface is adapted to abut and apply pressure to said selected portion on one side of the ear, the other of said clamping members terminating in a pad surface with an area greater than the area of said blunt surface and adapted to abut the other side of the ear; and

a biasing means for applying a clamping force to said clamping members.

4,319,575

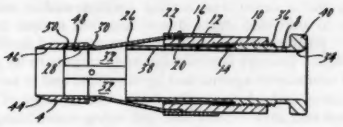
UNIVERSAL TREPHINE HANDLE

Charles A. Bonte, St. Louis, Mo., assignor to Storz Instrument Company, St. Louis, Mo.

Filed Sep. 7, 1979, Ser. No. 73,214

Int. Cl.³ A61B *17/32*

U.S. Cl. 128—305 **16 Claims**



1. A universal trephine handle particularly adapted for use in surgical procedures in combination with a tubular trephine blade, said universal trephine handle comprising:

a body, said body including a tubular portion, a ring member, and a plurality of fingers, one end portion of each of said fingers being positioned in a slot at a circumferentially spaced location on one end of said tubular portion and extending outwardly generally axially and radially inwardly therefrom, an opposite end portion of each of said fingers being radially movable;

said ring member being coaxially positioned on said tubular portion for retaining said end portions of said fingers in said slots;

a tubular member, said tubular member having a portion extending through said tubular portion of said body and being axially movable with respect to said body, said tubular member having one end adapted to engage a radially inwardly facing surface of each of said fingers, axial movement of said tubular member toward said opposite end portions of said fingers urging each of said opposite end portions in a radially outward direction;

means for supporting said trephine blade on said opposite end portions of said fingers; and

stop means on said opposite end portion of at least one of said fingers for limiting movement of a trephine blade toward said one end portion of said one of said fingers.

4,319,576

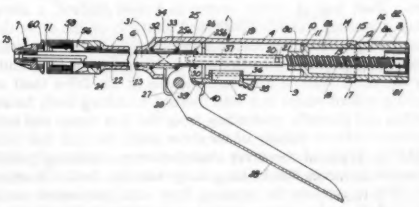
INTRALUMENAL ANASTOMOSIS SURGICAL STAPLING INSTRUMENT

Robert G. Rothfuss, Bellevue, Ky., assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Feb. 26, 1980, Ser. No. 124,954

Int. Cl.³ A61B *17/04, 17/32*

U.S. Cl. 128—305 **29 Claims**



1. A surgical stapling instrument of the type used to join together tubular body organs, said surgical stapling instrument comprising an elongated body having first and second ends, a cylindrical casing affixed coaxially on said first end of said body, at least one annular array of surgical staples mounted within said casing, an adjusting rod coaxially mounted within said body and said casing, said adjusting rod having a first end extending beyond said casing, an anvil mounted on said first

end of said adjusting rod, said anvil having an anvil surface facing said casing, an adjustment knob mounted at said second end of said body, said adjustment knob being hollow, said adjusting rod being operatively connected to said adjustment knob, said adjusting rod and said anvil being axially shiftable by operation of said adjustment knob between a position wherein said anvil surface is adjacent said casing and a position wherein said anvil surface is spaced from said casing, a staple driver and a cylindrical scalpel located within said casing, means to shift said staple driver and said scalpel from a retracted position within said casing toward said anvil to drive said staples through said tubular body organs to be joined, to clinch said staples against said anvil surface and to sever excess portions of said tubular body organs over a range of distances between said anvil surface and said casing constituting a working gap of said instrument, said adjusting rod having a second end located within said hollow adjustment knob, indicator means mounted on said second end of said adjusting rod and being so configured as to give both visual and tactile indications that the distance between said anvil surface and said casing is at and within said working gap, a scale in association with one of said adjustment knob and said second end of said body and a cooperating indicator mark on the other of said adjustment knob and said second end of said body enabling final adjustment of said distance between said anvil surface and said casing within said working gap according to the thickness of the tissue of the tubular body organs being joined.

4,319,577

SKULL TREPANATION DRILL

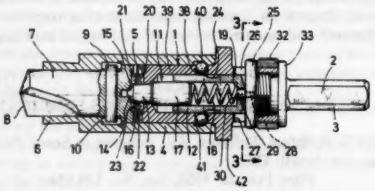
Gerhard Bofinger, Immendingen-Hattingen, and Wilfried Wölfle, Bad-Dürrheim, both of Fed. Rep. of Germany, assignors to Aesculap-Werke Aktiengesellschaft, Tuttlingen, Fed. Rep. of Germany

Filed Apr. 18, 1980, Ser. No. 141,635

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1979, 2916221

Int. Cl.³ A61B *17/32*

U.S. Cl. 128—305.1 **14 Claims**



1. In a skull trepanation drill of the class including a tubular drive shaft having a first recess in a wall thereof, a sleeve-shaped housing slidable axially and rotatably on the drive shaft and having a second recess in a wall thereof, a cutter rotatably fixed with respect to the housing and engageable for rotation by the drive shaft, a lock bolt slidable in the drive shaft and having a third recess in a wall thereof, a locking body located within and partially protruding from the first recess and being movable therein radially of the drive shaft, the lock bolt being slidable axially of the drive shaft between a locking position wherein it forces the locking body into the first and second recesses to restrain the housing from axial movement on the drive shaft, and a release position permitting the locking body to move into the third recess and out of the second recess, and spring means urging the lock bolt toward the locking position, the combination with said lock bolt of

a follower axially slidable on the drive shaft and engaging the lock bolt, and

a cam secured against axial displacement along the drive shaft, having a cam surface with a portion thereof bearing on the follower and being rotatable on the drive shaft to cause an annularly displaced portion of the cam surface to bear on the follower, thereby causing the follower to move axially of the drive shaft to move the lock bolt between said locking and release positions.

4,319,578

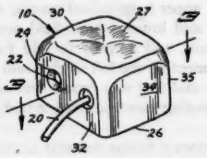
MICRO PH ELECTRODE ASSEMBLY FOR WIRE TRANSMISSION

Carl C. Enger, Lakewood, Ohio, assignor to General Mills, Inc., Minneapolis, Minn.

Filed Oct. 9, 1979, Ser. No. 82,448

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—635 **30 Claims**



1. A dental assembly useful for the wire transmission measurement of oral cavity fluids' ionic changes by attachment to an existing tooth, comprising:

A. a dental assembly housing, said housing having a bottom, an opposed pair of end faces, a curvilinear surface, and an axial bore having a first aperture on one end face and a second aperture on the other end face;

B. an ionic indicator electrode assembly comprising:

a tubular housing having a first and a second opposed pair of open ends and wherein the housing is of heat shrunken material;

a cylindrical indicator electrode which is responsive to changes in ionic activity, said indicator electrode including an electrode stem and wherein the electrode is positioned within the tubular housing proximate the first end of the tubular housing defining an annular space therebetween;

a first means for sealing the electrode to the tubular housing against moisture migration;

an electrically conductive cylindrical plug positioned proximate the second end of the tubular housing, said plug having a means for electrically connecting the transmission wire to the plug;

a second means for sealing the plug to the tubular housing against moisture migration;

a third means for sealing the transmission wire to the plug against moisture migration;

a means for electrically connecting the indicator electrode to the plug;

wherein the ionic indicator electrode assembly is positioned within the axial bore such that the first end of the housing is proximate the aperture of one end face; and;

a means for fixedly attaching the dental housing to the tooth.

4,319,579

REUSABLE MEDICAL ELECTRODE HAVING DISPOSABLE ELECTROLYTE CARRIER

James V. Cartmell, Dayton, Ohio, assignor to NDM Corporation, Dayton, Ohio

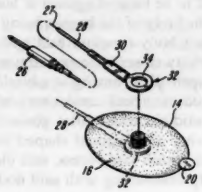
Continuation of Ser. No. 50,626, Jun. 21, 1979, abandoned. This application Dec. 11, 1980, Ser. No. 215,277

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—640 **16 Claims**

1. A medical electrode comprising a disposable portion and a reusable portion, said disposable portion comprising a shaped absorbent body soaked with an electrolyte and a pliant sheet member having an adhesive layer on one side thereof, said

adhesive layer adhering an end of said body to said one side of said sheet member, said body protruding outwardly from said adhesive layer, said reusable portion comprising terminal



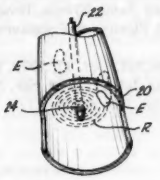
means for transmitting electrical signals and readily separable from said disposable portion, said terminal means having an inside wall embracing and substantially surrounding said shaped body.

4,319,580

METHOD FOR DETECTING AIR EMBOLI IN THE BLOOD IN AN INTRACORPOREAL BLOOD VESSEL

Peter S. Colley, Seattle, and Roy W. Martin, Redmond, both of Wash., assignors to The Board of Regents of the University of Washington, Seattle, Wash.

Filed Aug. 28, 1979, Ser. No. 70,356
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—661 **9 Claims**



1. A method for detecting air emboli in the blood in an intracorporeal blood vessel, by the use of an elongated catheter on which is located, adjacent a tip of said catheter, an ultrasonic transducer means capable of ensonifying a substantially planar region that extends radially outwardly from said transducer means and which is oriented transversely with respect to the longitudinal axis of said elongated catheter, said method comprising the steps of:

(a) positioning said catheter within a body containing said blood vessel so that said tip of said catheter is at least proximate to said blood vessel and so that said substantially planar region transects said blood vessel at a desired location therein;

(b) energizing said ultrasonic transducer means with a high frequency electrical signal so as to cause said ultrasonic transducer means to transmit ultrasonic energy radially outwardly in said substantially planar region;

(c) detecting electrical return signals generated by said ultrasonic transducer means as a result of returns of said transmitted ultrasonic energy from objects in said substantially planar region; and

(d) monitoring said detected electrical return signals for those characteristic of air emboli.

4,319,581

HEART PULSE MONITORING APPARATUS

John W. Cutter, 10 Sleepy Hollow La., Orinda, Calif. 94563

Filed Jun. 19, 1980, Ser. No. 161,074
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—707 **10 Claims**

1. A heart pulse monitoring apparatus for attachment to the handlebar of an exercising device for measurement of the pulse rate of a user, comprising:

a first hand grip for attachment to one end of the handlebar of a bicycle or stationary exercise device and having first means for completing an electrical circuit from a hand of said user when gripping said first hand grip to a conductive part of said handlebar;

a second hand grip including a second means for electrically contacting the other end of said handlebar, said second means being electrically isolated from the other hand of said user when gripping said second hand grip, third and fourth means disposed upon said second hand grip in spaced apart relationship and adapted to electrically engage said other hand of said user when gripping said second hand grip; and

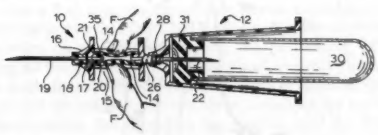
signal monitoring means electrically coupled to said second, third and fourth means for measuring electric pulses created in the body of said user whose hands are holding said first and second hand grips and for indicating the heart pulse rate of such body.

4,319,582

FLUID FLOW CONTROL DEVICE FOR USE WITH AN EVACUATED BLOOD COLLECTION CONTAINER

William N. Eldridge, Rutherford, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Feb. 4, 1980, Ser. No. 118,158
Int. Cl.³ A61B *5/14*
U.S. Cl. 128—766 **4 Claims**



1. A fluid flow control device for use with an evacuated blood collection container in the collection of blood from a patient comprising:

a substantially rigid hollow body;

a first needle cannula connected to one end of said body adapted to penetrate a vein of a patient;

a second needle cannula connected to the opposite end of said body adapted to penetrate a stopper in an evacuated blood collection container, said first and second needle cannulae being connected to said body with a space in the hollow portion of said body therebetween; and

a resilient, collapsible passage member inside said hollow body connecting said first and second cannulae in fluid

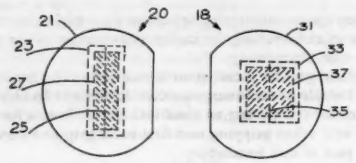
communication with each other, said passage member contacting said body only at its ends with its central portion positioned in said space to remain free of contact with said body during use, said body having means through its side wall for access to said passage member, said passage member being accessible to finger grip from at least two different directions through said access means to allow an operator of said device to apply pressure with the fingers to control fluid flow through said passage member.

4,319,583

ANIMAL BIRTH DETECTOR

Lee E. Ingle, Douglas, Ariz., assignor to Warren R. Jewett, Tucson, Ariz., a part interest

Filed Apr. 6, 1979, Ser. No. 27,943
Int. Cl.³ A61B 5/10
U.S. Cl. 128—775 **6 Claims**



1. A device for detecting fetal birth in animals by monitoring vulva separation comprising:

a two-part non-operably connected vulva separation detection means adapted to be attached on opposite sides proximate the animal's vulva, said vulva separation means defining means sensing proximity of one side of the vulva to the other, and

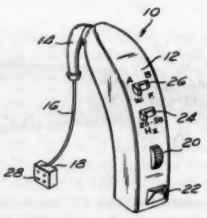
signal transmission means operably connected to said vulva separation detection means whereby when the animal's vulva separates, the vulva separation detection means senses separation of one side of the vulva from the other and the signal transmission means transmits such occurrence.

4,319,584

ELECTRICAL PULSE ACUPRESSURE SYSTEM

Francis J. McCall, 19231 Victory Blvd., Reseda, Calif. 91335

Filed May 19, 1980, Ser. No. 151,184
Int. Cl.³ A61N 1/36
U.S. Cl. 128—789 **6 Claims**



1. An electrical pulse acupressure system adapted to be worn by a human being in contact with the ear, said system comprising:

an electrical pulse generating means, said electrical pulse generating means located within a housing, said housing including special structure means for facilitating connection with the ear;

an electrical pulse applicator, said applicator including means to closely conform in a tight fitting manner with the interior of the ear, said applicator to be carried by the human being, metallic nodule means mounted within an exterior surface of said applicator, said applicator to receive electrical pulses from said electrical pulse generating means and conduct such through said metallic nodule means into the body of the human being, said nodule means adapted to be located against at least one acupuncture point of the body of the human being to thereby treat a corresponding body function said nodule means comprising of plurality of separate nodules; and

a polygonal shaped plug having a plurality of electrical connectors, said electrical connectors being electrically connected to said electrical pulse generating means, said applicator having a polygonal shaped recess, said plug matingly fitted within said recess, said electrical connectors electrically connecting with said nodules.

4,319,585

7-METHYL-1,2-BENZOPYRONE AS A TOBACCO FLAVORANT

Andrew G. Kallianos, Durham, N.C., and Everett W. Southwick, Richmond, Va., assignors to Liggett Group Inc.

Filed May 7, 1980, Ser. No. 147,079
Int. Cl.³ A24B 3/12
U.S. Cl. 131—275 **5 Claims**

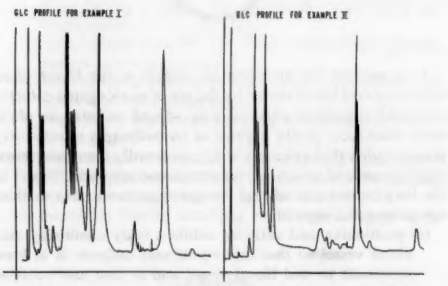
1. A method for improving the flavor and aroma of a tobacco product which comprises adding thereto 7-methyl-1,2-benzopyrone in an amount from about 0.0001 to about 0.1 percent by weight of the tobacco.

4,319,586

USES OF HEXENOL DERIVATIVES IN AUGEMENTING OR ENHANCING THE AROMA OR TASTE OF SMOKING TOBACCO COMPOSITIONS AND SMOKING TOBACCO ARTICLES

Cynthia J. Mussinan, Bricktown; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust; Frederick L. Schmitt, Holmdel; Edward J. Granda, Englishtown; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 85,707, Oct. 17, 1979, Pat. No. 4,241,098. This application Jul. 17, 1980, Ser. No. 169,901
Int. Cl.³ A24B 3/12
U.S. Cl. 131—276 **3 Claims**



1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of intimately admixing with smoking tobacco an aroma or taste augmenting or enhancing quantity of at least one substance selected from the group consisting of:

A. A composition of matter consisting essentially of cis-3-hexenal, cis-3-hexenyl-cis-3-hexenoate, trans-2-hexenal, and cis-3-hexenol;

B. A composition of matter consisting essentially of cis-3-hexenal, cis-3-hexenyl-cis-3-hexenoate, cis-3-hexenyl formate and trans-2-hexenal;

C. A composition of matter consisting essentially of cis-3-

hexenal, cis-3-hexenyl-cis-3-hexenoate, cis-3-hexenol, cis-3-hexenyl formate and trans-2-hexenal; and

D. Cis-3-hexenyl methyl ether.

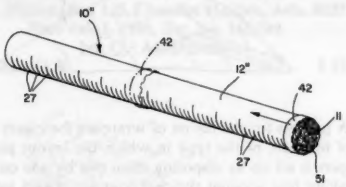
4,319,587
SMOKING ARTICLE

Irving S. Moser, 1625 Winton Ave., Havertown, Pa. 19083, assignor to Irving S. Moser, Havertown, Pa.

Continuation-in-part of Ser. No. 584,921, Jun. 9, 1975, abandoned. This application Jun. 28, 1976, Ser. No. 700,579

Int. Cl.³ A24D *1/02, 1/16;* **A24F** *1/00, 47/00*

U.S. Cl. 131—270 **4 Claims**



1. For use with a generally cylindrical smoking article having an end to be lit and an opposite end to be inserted into the mouth when the article is smoked, positive control means for selecting the extent of consumption of said smoking article, to assist a smoker in curtailing or terminating his smoking habit, said means comprising:

(a) control indicia disposed on the smoking article and extending from the end of the article to be lit toward the opposite end of the article, said control indicia comprising a plurality of spaced external markings extending axially along the article, and

(b) an annular control indicator mounted telescopically on the smoking article and being secured detachably to the smoking article adjacent one end thereof, said annular control indicator being detachable from the smoking article with capacity for being slidable axially relative thereto, said control indicator, when detached, comprising a smoking control alert band selectively displaceable on the article relative to the markings,

(c) said control indicia and said annular control indicator cooperating to provide a smoker with heightened awareness of his smoking habit, whereby the smoker is enabled to affirmatively, selectively and voluntarily control said habit.

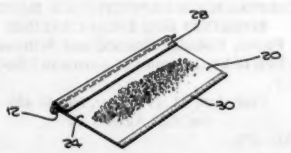
4,319,588
APPARATUS AND METHOD FOR CIGARETTE ROLLING AND HOLDING

Henry J. Evans, 14113 San Antonio Dr., Norwalk, Calif. 90650

Filed Jun. 2, 1980, Ser. No. 155,138

Int. Cl.³ A24B *5/00*

U.S. Cl. 131—280 **3 Claims**



1. A method of rolling a cigarette from a generally rectangular cigarette paper and for supporting said cigarette during the consumption thereof by smoking, comprising:

placing an elongated member adjacent one longitudinal edge of said paper prior to said rolling;

simultaneously placing a curved member attached to said elongated member in engaging relation with a transverse edge of said paper adjacent said longitudinal edge prior to said rolling;

folding said longitudinal edge over said elongated member;

rolling said paper inwardly from said longitudinal edge to form said cigarette, while simultaneously maintaining said curved member in crimping engagement with said transverse edge to prevent movement of said elongated member during said rolling;

manually supporting said cigarette during the initial stages of consumption, said consumption increasingly exposing said elongated member;

supporting said cigarette by said elongated member during the final stages of consumption to prevent singeing of the smoker's fingers, while maintaining said curved member in crimping engagement with said transverse edge to prevent movement of said longitudinal member; and

retaining said curved member and said elongated member after consumption of said cigarette for reuse.

4,319,589
METHOD AND APPARATUS FOR PERFORATING ROD-LIKE ARTICLES

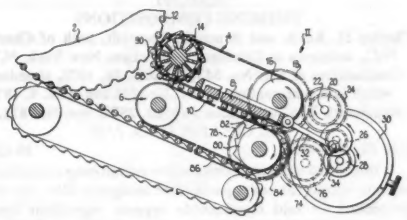
Francis A. M. Labbe, Neuilly-sur-Seine, France, assignor to Molins Limited, London, England

Filed Apr. 3, 1979, Ser. No. 26,807

Claims priority, application United Kingdom, Apr. 7, 1978, 13690/78

Int. Cl.³ A24C *5/60*

U.S. Cl. 131—281 **19 Claims**



1. A method of simultaneously perforating a plurality of rod-like articles such as cigarettes, comprising the steps of holding and transporting a group of articles in a row with their axes parallel between parallel flights of two conveyors; moving a perforating device towards the articles so as to perforate them over a first area, the perforating device extending in the plane of the conveyor flights and having a plurality of perforating needles on one face, retracting the perforating device, rotating all the articles of the group simultaneously through a preset angle by moving the two conveyors at different speeds so as to roll the articles between them, actuating the perforating device again, and repeating the process until the desired number of perforations have been provided in each article.

4,319,590
CIGARETTE WITH REMOVABLE SMOKE-MODIFYING CARTRIDGES

Sam F. Patarra, 125 NW. 126th St., North Miami, Fla. 33168

Filed Nov. 20, 1980, Ser. No. 208,555

Int. Cl.³ A24D *3/04*

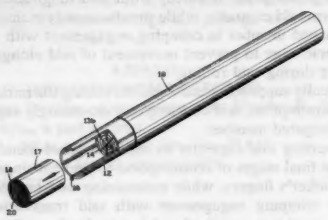
U.S. Cl. 131—331 **6 Claims**

1. In a cigarette with a tubular mouthpiece defining a recess which is open at one end, the improvement which comprises:

a smoke-modifying cartridge snugly received in said recess and slidably removable therefrom through said open end;

and a pull element operatively coupled to said cartridge and extending to said open end of said recess for pulling the cartridge out of said recess;

said pull element being a flexible string extending longitudinally through said cartridge and having a transverse enlargement at the inner end of said cartridge;



a second smoke-modifying cartridge snugly received in said recess in end-to-end relationship with said first-mentioned cartridge, said second cartridge being slidably removable from said recess through the latter's open end;

and a second flexible pull string extending longitudinally through said second cartridge to the open end of said recess, said second pull string having a transverse enlargement at the inner end of said second cartridge.

4,319,591

SMOKING COMPOSITIONS

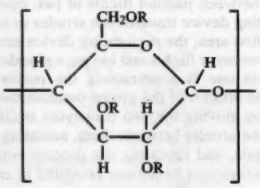
Charles H. Keith, and Bruce D. Karstedt, both of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 543,750, Jan. 24, 1975, abandoned, which is a continuation of Ser. No. 224,996, Feb. 9, 1972, abandoned. This application Jan. 23, 1978, Ser. No. 871,673

Int. Cl.³ A24B *15/30, 1/18*

U.S. Cl. 131—359 **10 Claims**

1. Improved smoking composition comprising a combustible organic ingredient and a particulate inorganic filler, the major proportion of said combustible organic ingredient being a material selected from the group consisting of film-forming cellulose derivatives, their salts and mixtures thereof having the recurring anhydroglucose unit:



wherein at least one R is selected from the group consisting of lower alkyl, carboxyl lower alkyl, hydroxy lower alkyl groups and mixtures thereof; and the remaining Rs are hydrogen and the average degree of substitution is from about 0.2 to 3.0; said major portion of said combustible organic ingredient and said particulate inorganic filler being present in a weight to weight ratio of about 15:85 to 85:15 and from about 0.1 to 5.0 percent by weight of said smoking composition of a material selected from the group consisting of proteins and protein hydrolysates, at least 80 percent of the weight of which is derived from aliphatic and heterocyclic amino acids.

4,319,592

PROCESS FOR THE LAYOUT OF WRAPPERS FOR CIGARS IN A HALF-LEAF OF TOBACCO

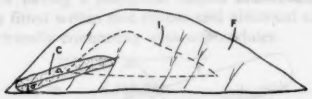
Jean-Francois Leclerc, Orleans; Jacques Paret, Fleury-les-Aubrais, and Pierre Waegaert, Bordeaux, all of France, assignors to Service d'Exploitation Industrialle des Tabacs et des Allumettes, France

Filed Feb. 4, 1980, Ser. No. 118,530

Claims priority, application France, Feb. 9, 1979, 79 03287

Int. Cl.³ A24C *1/04, 1/00*

U.S. Cl. 131—365 **3 Claims**



1. A process for the layout of wrappers for cigars in a half-leaf of tobacco, of the type in which the layout plan of the wrappers is set up by disposing them one by one on the half-leaf taking into account the real contour of said leaf and its possible blemishes, the wrappers being placed tangentially with respect to one another and/or to the contour of the half-leaf and/or to the possible blemishes, said process comprising the steps of:

(a) displacing, parallel to itself, within the half-leaf, a wrapper remaining tangential to the contour of the half-leaf and oriented so that its main axis makes with the main axis of the half-leaf a given angle σ_1, and determining the locus of the centres of this wrapper of so-called "angle of orientation σ_1";

(b) displacing, parallel to itself, within the half-leaf, a wrapper of the same orientation σ_1 but so that it remains tangential to a blemish, and determining the locus of the centres of this wrapper;

(c) rectifying the locus of the centres of the wrappers of orientation σ_1, by subtracting from the zone within this locus all the zone inside the locus determined in (b), thus obtaining a so-called "rectified locus";

(d) renewing the operations provided in (a), (b) and (c) for each of the blemishes and for each of the angles of orientation σ, so as to obtain a set of rectified loci of the centres of wrappers;

(e) determining the envelope of the set of the rectified loci, said envelope defining the zone within which the centres of the wrappers must be placed;

(f) placing a first wrapper so that its centre is within said zone defined in (e);

(g) proceeding with a second wrapper, as for the first wrapper, i.e. by carrying out operations (a) to (f) therewith and considering the first placed wrapper as being a blemish;

(h) similarly renewing the lay-out operations of the following wrappers until the set of the rectified loci defined in (d) is zero.

4,319,593

METHOD FOR HIGH CONSISTENCY REFINING OF TOBACCO FOR FILM CASTING

Dallas O. Pinion, Colonial Heights, and William W. Sadler, Chester, both of Va., assignors to American Brands, Inc., New York, N.Y.

Filed Jun. 22, 1979, Ser. No. 51,459

Int. Cl.³ A24B *3/14*

U.S. Cl. 131—372 **3 Claims**

1. A method of producing an all-tobacco material cast film comprising

(a) mixing small particle tobacco material with water to attain a mixture with about 30 to about 50% by weight tobacco material;

(b) refining the wetted tobacco material to a CSF of −500

ml to −900 ml so as to rupture cell walls and reduce fiber length;

(c) passing the mixture through a colloid mill to reduce the size of any agglomerated materials without further refining of the remaining part of the mixture;

(d) diluting the refined mixture with water and humectant to form a slurry of a consistency suitable for film casting;

(e) casting the homogeneous slurry on a non-porous surface; and

(f) drying the cast slurry.

4,319,594

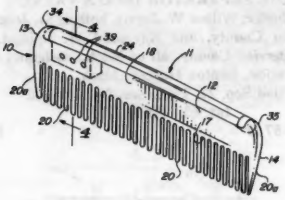
COMBINATION TOILET ARTICLE

Donald K. Parker, Box 125, Chandler Heights, Ariz. 85227

Filed Jul. 3, 1980, Ser. No. 165,749

Int. Cl.[2] A45D *24/00*

U.S. Cl. 132—11 R **8 Claims**



1. An improved toilet article adapted to be carried within a pocket or purse and for attending to selected personal grooming requirements, said toilet article comprising:

a hair grooming device including;

an elongate backbone having upper and lower longitudinal edges and a pair of spaced apart ends, each end having a lug upstanding from the upper longitudinal edge, each lug having a rounded socket;

means forming a well proximate one end of said backbone, said well extending inwardly from the upper longitudinal edge of said backbone;

a plurality of hair engaging elements depending from the lower longitudinal edge of said backbone;

a brush having an elongate handle element having upper and lower longitudinal edges and a pair of spaced apart ends shaped for mating engagement respectively with the sockets of the backbone and a plurality of bristles arranged in a cluster mounted on and depending from the lower longitudinal edge of the handle element proximate one end of said handle; and

said brush being removably mountable on the backbone of the grooming device with the ends of the elongate handle element of the brush positioned in the sockets of the lugs of said backbone and with the cluster of bristles of the brush being positioned in the means forming a well of the backbone.

4,319,595

DENTAL CARE UNIT

Rex Ulrich, 478 W. Heyburn, Twin Falls, Id. 83301

Filed Jan. 30, 1980, Ser. No. 116,770

Int. Cl.[3] A61C *15/00*

U.S. Cl. 132—92 R **10 Claims**

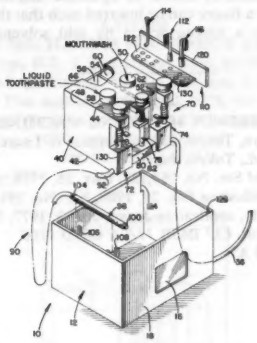
1. A dental care unit comprising:

a housing;

a hollow base accommodated in said housing, said base including a plurality of containers therein for storing a plurality of liquids in said base;

a plurality of dispenser control mechanisms on said base each being fluidly connected to an associated one of said containers for controlling the amount of liquid removed from said associated container, each control mechanism including a base housing, a fluid passage defined in said base having a first portion and a second portion, a dispensing passage defined in said base, a vent passage defined in said base, a dispensing piston located in said first portion, urging means biasing said dispensing piston into said upright portion, a vent control piston located in said vent passage and coupled to said dispensing piston, a stop mounted to abut said vent control piston to limit the travel of said pistons, seal means on said control mechanism piston, said control mechanism piston being movable from a first position wherein said seal means prevents fluid communication between said associated container and said fluid passage to a second position permitting such fluid communication, and means for moving said control mechanism piston;

a mixing chamber defining means on said base having a mixture chamber fluidly connected to said dispensing passages of said dispenser control mechanisms to receive liquid therefrom, said mixing chamber defining means including a piston received in a piston bore which is fluidly connected to said mixing chamber and to atmosphere, stop means limiting the amount of movement of said mixing chamber piston, seal means on said piston, said mixing chamber piston being movable to a first position wherein said seal means prevents fluid communication between said mixing chamber and atmosphere to a second position



permitting such fluid communication, and means for moving said mixing chamber piston;

an inlet hose fluidly connected to one dispensing passage of said dispensing passages for conducting liquid thereoutof;

whereby with said control mechanism pistons and said mixing chamber piston in said second positions fluids from containers associated with said control mechanisms flow from said containers to said mixing chamber and liquid conducted into said one dispensing passage flows into said mixing chamber to mix with said fluids to form a mixture, said mixture flowing out of said mixing chamber and into said outlet hose via said another dispensing passage, said control mechanism venting means controlling fluid flow into said fluid passage first portion and said mixing chamber piston controlling flow into said mixing chamber so that mixing of said fluid and said liquid is controlled;

a chuck connected to said outlet hose, said chuck having a fluid passage therein which is fluidly connected to said outlet hose; and

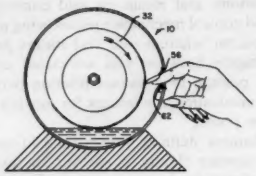
a plurality of different dental care instruments in said housing, each instrument performing a different dental function, and each instrument having means for attaching said each instrument to said chuck, each instrument having a fluid passage therein which is fluidly connected to said chuck fluid passage and liquid dispensing means for dispensing liquid into a user's mouth.

4,319,596

NAIL POLISH REMOVING DEVICE

Lonnie A. Jackson, P.O. Box 168, Bluff City, Tenn. 37618

Filed May 21, 1980, Ser. No. 151,938
Int. Cl.[3] A45D *29/05*
U.S. Cl. 132—73.6 5 Claims



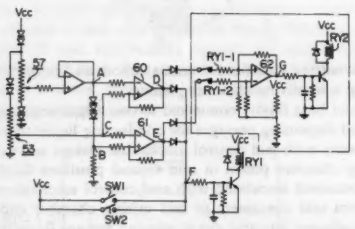
1. A nail polish removing device comprising motor driven rotary brush means mounted in a substantially leakproof housing, said housing having a nail polish solvent reservoir at its bottom, wherein said brush means rotates about a substantially horizontal axis, a portion of said brush means coming into contact with said nail polish solvent reservoir and being wet by it, the rotation of said brush means moving it past one or a series of openings in said housing, each of which openings is normally substantially sealed by openable diaphragm means through which a finger can be inserted such that the fingernail is contacted in a wiping action by said solvent-wet brush means.

4,319,597

CURRENCY HANDLING MACHINE

Katusuke Furuya, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 964,429, Nov. 28, 1978, abandoned.
This application Sep. 29, 1980, Ser. No. 191,960
Claims priority, application Japan, Jun. 3, 1977, 52-72385[U]
Int. Cl.[3] B65B *11/04*; G07D *9/00*
U.S. Cl. 133—8 A 7 Claims



1. A coin handling machine including an operation section having selectable movable members, further comprising:

a setting potentiometer including a movable member which is rotatable to designate coin species, and providing an output;

a selecting potentiometer including a movable member which is rotatable together with one of the selectable movable members in the operation section and providing an output;

control circuit means for detecting a differential potential between the respective outputs of the setting potentiometer and the selecting potentiometer to issue a driving signal and a rotating direction selecting signal;

driving circuit means connected to the control circuit means for receiving the driving signal and issuing a motor drive signal;

motor means connected to the driving circuit means for rotating the selectable movable members in the operation section in accordance with the motor drive signal; and

rotating direction selecting circuit means connected to the control circuit means for receiving the rotating direction selecting signal and for determining the direction of rotation of the motor means in response to the rotating direction selecting signal before the driving circuit means receives the driving signal and for holding the rotating direction selecting signal constant once the driving circuit means receives the driving signal,

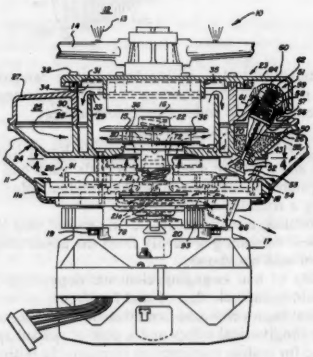
wherein the driving circuit means comprises a motor driving relay having contacts through which the rotating direction selecting signal is transmitted to the rotating direction selecting circuit means and energized in response to the driving signal to open its contacts.

4,319,598

SOIL SEPARATOR DRAIN VALVE

Geoffrey L. Dingler; Wilbur W. Jarvis, both of St. Joseph Township, Berrien County, and Raymond W. Spiegel, Lincoln Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 22, 1980, Ser. No. 189,782
Int. Cl.[3] B08B *3/02*
U.S. Cl. 134—57 D 19 Claims



1. In a dishwasher having spray means, a rotatable wash impeller for circulating dishwashing liquid to said spray means for washing dishes in said dishwasher, means defining an accumulator chamber, means for conducting dishwashing liquid from said wash impeller to the accumulator chamber, said accumulator chamber defining means for collecting soil from the dishwashing liquid to define cleansed dishwashing liquid, means for conducting the cleansed dishwashing liquid to the wash impeller, drain means for conducting the collected soil from the accumulator chamber, said drain means defining a drain opening to said accumulator chamber, said drain means further including a rotatable drain impeller, and valve means for selectively closing said drain opening, the improvement comprising:

pressure-responsive means for operating said valve means to close said drain opening as a result of liquid pressure built up in said accumulator chamber caused by operation of said wash impeller to circulate the dishwashing liquid for washing dishes in a wash operation; and

means for causing said drain impeller to be operated to direct the dishwashing liquid outwardly through said drain means in a drain operation upon completion of a dishwashing operation, said pressure-responsive means operating said valve means to open said drain opening as a result of a reduction in pressure in said accumulator chamber, said drain impeller further tending to move said valve

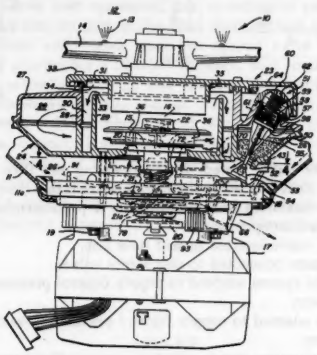
means to open said drain opening during said drain operation.

4,319,599

VERTICAL SOIL SEPARATOR FOR DISHWASHER

Geoffrey L. Dingler; Wilbur W. Jarvis, both of St. Joseph Township, Berrien County, and Raymond W. Spiegel, Lincoln Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 22, 1980, Ser. No. 189,783
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—104 **16 Claims**



10. In a dishwasher structure having a spray device, a dishwashing liquid circulation pump comprising:

a pump chamber;

a centrifugal pump impeller in said chamber for discharging dishwashing liquid from said chamber;

means for conducting to said spray device dishwashing liquid discharged by said pump impeller;

wall means defining an accumulator chamber;

guide chamber means fluidly connected to said liquid discharging from said pump chamber and to said accumulator chamber for directing a soil laden portion of the discharged liquid to said accumulator chamber;

means in said accumulator chamber for collecting soil material from said soil laden portion to provide a cleansed liquid; and

means for returning the cleansed liquid to said pump chamber to be discharged with additional dishwashing liquid delivered thereto.

4,319,600

UMBRELLA

Hugo Roche, c/o M. O'Leary, P.O. Box 274, Worcester, Mass. 01601

Filed Aug. 21, 1980, Ser. No. 179,951
Int. Cl.³ A45B *25/22, 23/00*
U.S. Cl. 135—20 M **7 Claims**

1. Umbrella, comprising:

(a) a tubular main post, adapted to be mounted in the ground in a vertical position,

(b) a generally circular foldable canopy carried above the upper end of the main post,

(c) braces connecting the canopy to a hub that is slidably mounted on an intermediate portion of the post,

(d) means for moving the hub vertically along the post from a high position where the canopy is raised to a low position where the canopy is folded,

(e) an auxiliary post slidably mounted in the upper portion of the main post, the center of the canopy being connected to the upper end of the auxiliary post, and

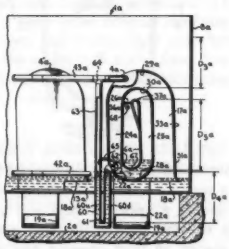
(f) a spring acting between the main post and the auxiliary post to resist upward movement of the auxiliary post when wind acts on the canopy.

4,319,601

TRIGGER MECHANISM FOR SIPHON APPARATUS

John A. George, R.R. 1, Uniontown, Kans. 66779

Continuation-in-part of Ser. No. 821,404, Aug. 3, 1977, Pat. No. 4,181,142. This application May 30, 1979, Ser. No. 43,962
The portion of the term of this patent subsequent to Feb. 10, 1998, has been disclaimed.
Int. Cl.³ F04F *10/02*
U.S. Cl. 137—124 **6 Claims**



1. In a liquid siphon for discharging liquid from a tank at the end of a discharge cycle; said siphon having a flow pathway comprising a plurality of legs and a plurality of bends interconnecting said legs; one of said bends comprising a first liquid trap having a predetermined maximum fill level associated with the tank being substantially empty and one of said bends comprising an air trap; said air trap being positioned upstream of said first liquid trap; said siphon also including filling means to fill said first liquid trap after discharging said liquid from said tank and before a subsequent filling of the tank; the improvement comprising a device for eliminating liquid received from said filling means in excess of the amount required to achieve the maximum fill level in said first liquid trap associated with the tank being substantially empty and for triggering the discharge of the liquid from said tank when the liquid therein reaches a predetermined level; said device comprising:

(a) a second liquid trap having an outlet at a downstream end thereof and an inlet at an upstream end thereof; said outlet having a level being not elevated above the maximum fill

level of said first trap associated with the tank being full; and

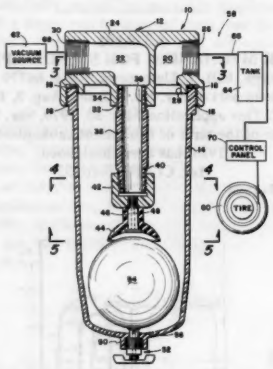
(b) flow means connecting said inlet of said second liquid trap and said first liquid trap and cooperating with said filling means, such that when said first liquid trap is filled greater than said maximum fill level associated with the tank being substantially empty by said filling means, then excess liquid in said first liquid trap flows through said flow means to said second liquid trap and such that when no excess liquid is in said first liquid trap, then said flow means communicates with said air trap.

4,319,602

VACUUM CHECK BOWL

Richard J. Mullen, Grand Island, Nebr., assignor to Chief Industries, Inc., Grand Island, Nebr.

Filed May 12, 1980, Ser. No. 149,267
Int. Cl.³ F16K *31/22*
U.S. Cl. 137—202 **2 Claims**



1. A vacuum check bowl for preventing liquid from being injested into a vacuum source comprising:

a housing having a upper portion and a lower elongated vertically situated removable bowl portion, said upper portion having an inlet opening and an outlet opening through said upper portion, said outlet opening in communication with said vacuum source;

a conduit means in communication with said outlet opening vertically disposed downwardly within said lower bowl portion, with the lower end of said conduit means terminating substantially above the bottom of said lower bowl portion;

a rubber cup attached to the bottom of said conduit means, said rubber cup having a central bore therethrough for fluid communication from the interior of the lower bowl portion to said conduit and having a concave resilient seating surface facing the bottom of said lower bowl portion;

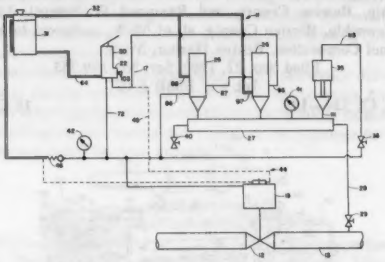
a spherical, floatable, and freely rotatable valve positioned below said rubber cup and of diameter substantially less than the diameter of said lower bowl portion but larger in diameter than the diameter of said rubber cup, the curvature of said spherical valve being substantially equal to the curvature of said concave seating surface of said rubber cup.

4,319,603

SELF-CONTAINED SAFETY SYSTEM

David E. Snyder, Longview, Tex., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Sep. 8, 1980, Ser. No. 184,983
Int. Cl.³ F16K *31/12*
U.S. Cl. 137—492.5 **17 Claims**



1. Safety valve system for maintaining the flow of fluid through a flow line when the line pressure is less than a predetermined maximum and greater than a predetermined minimum, which comprises:

a safety valve inserted in said flow line;

an actuator connected to said safety valve;

a control system adapted to supply control pressure to said actuator;

a pump adapted to supply control pressure to said control system;

a high pressure sensor adapted to sense line pressure and vent said control system when said line pressure is greater than said predetermined maximum;

a low pressure sensor adapted to sense line pressure and vent said control system when said line pressure is less than said predetermined minimum; and

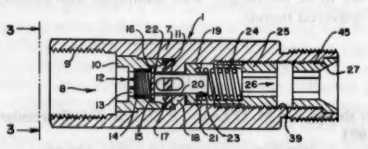
accumulator means for maintaining said control pressure at a level proportional to said line pressure and accommodating changes in the volume of said control system due to changes in ambient temperature and leakage.

4,319,604

SAFETY SHUT-OFF VALVE

Robert E. Bird, Eureka, Mo., assignor to Modern Engineering Company, Inc., St. Louis, Mo.

Filed Feb. 19, 1980, Ser. No. 122,136
Int. Cl.³ F16K *31/12*
U.S. Cl. 137—498 **16 Claims**



1. In a safety shut-off valve for use in a flow line for delivery of a fluid including gas under regulated pressure from a source to another location for usage, comprising, a valve housing, said housing having a passage therethrough, a first valve means including a seat fixed within said housing, a shiftable valve comprising a flapper valve disposed normally resting against said valve seat to maintain said valve means in closure when pressurized fluid from the source is curtailed, a second valve seat provided downstream in said valve housing and being located a fixed distance from said first valve seat, said valve housing and first valve means cooperating to form a clearance passageway means therethrough and arranged intermediate the first and second valve seats for allowing conveyance of

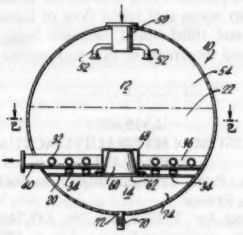
fluid through the housing and around the shiftable valve when the shiftable valve becomes unseated from its said first valve seat, means constantly biasing said shiftable valve away from said first valve seat, said biasing means comprising a spring means arranged between the shiftable valve and within the first valve means, a movable regulator located in said valve housing passageway and normally being biased against said shiftable valve for urging it against its first said valve seat, a second spring means normally biasing said regulator against the said same shiftable valve for urging it against its said first valve seat, said second spring means being adjustably of greater strength than the first said spring means, each of said spring means biasing in contact upon opposite sides of the said shiftable flapper valve, said regulator also including a passageway therein for conveyance of the fluid therethrough before the said shiftable valve seats upon the second valve seat, said regulator comprising a channel member, said regulator passageway extending through said member and opening at one end proximate the location of contact of said regulator with the said shiftable valve, whereby upon release of the pressurized fluid from its source it urges said shiftable valve off its first said seat for delivery of fluid to another location, and upon the release of fluid above the regulated quantity forcing said shiftable valve against the said second valve seat to shut off any further delivery of pressurized fluid therethrough.

4,319,605

PRESSURE EQUALIZATION MEANS

Jacques Boudin, 90 Wheatsheaf Rd., Ivyland, Pa. 18974

Filed Nov. 30, 1978, Ser. No. 965,380
Int. Cl.³ F17C *13/00*
U.S. Cl. 137—590 **4 Claims**



1. In a fluid treatment tank of the type having an inlet, an underdrain disposed above the tank bottom, and an outlet communicating with the underdrain, the improvement comprising:

A. a substantially rigid barrier extending across the tank and disposed in the tank between the underdrain and the tank bottom to divide the tank into a first volume and a second volume, substantially all of said first volume located above said barrier and substantially all of said second volume located below said barrier, said first volume and said second volume each adapted to contain fluid without intermixing therebetween, said rigid barrier having an opening therethrough; and

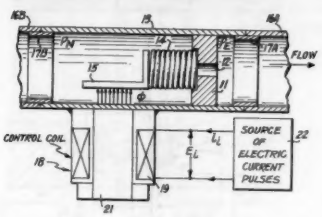
B. a diaphragm being positioned on said rigid barrier to completely cover said opening, said diaphragm communicating with the fluids in said first volume and said second volume, whereby fluid pressure is transmitted through the opening to said diaphragm causing said diaphragm to flex toward the volume of lower pressure to thereby equalize the pressure between said volumes.

4,319,606

FLUID PRESSURE REGULATOR VALVE

Leo Hoogenboom, 13 Hillcrest Dr., Ballston Lake, N.Y. 12019, assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jun. 17, 1980, Ser. No. 160,317
Int. Cl.³ F16K *31/06*; G05D *16/20*
U.S. Cl. 137—625.3 **11 Claims**



1. An improved fluid pressure regulator valve comprising a base member having a flow control orifice therethrough adapted to be secured in a fluid conduit in a position to stop all fluid flow through the conduit with the regulator valve in a full closed position, an elongated helically coiled spring member having the coils thereof compressed into engagement with each other to enclose the sides of the spring member in a fluid-tight manner and adapted to be mounted within the fluid conduit on the upstream side of said base member, said helically coiled spring having a central open passageway therethrough with one end closed in a fluid-tight manner and the remaining open-end secured over the orifice through said base member, a magnetically permeable armature secured to the closed end of the helically coiled spring for flexing the spring in an off-axis direction, and an electromagnet positioned adjacent the armature for producing lines of magnetic flux which thread the armature and cause the armature to lever the helically coiled spring open in an off-axis direction and thereby open spaces between the compressed coils comprising the enclosed sides of the spring and allow fluid flow through the regulator valve upon actuation of the electromagnet.

4,319,607

VALVE ASSEMBLY AND VALVE SEALING ELEMENT

Larry D. Fields, Myra Loma, Calif., assignor to Yardney Electric Corporation, Pawcatuck, Conn.

Filed Dec. 26, 1979, Ser. No. 106,812
Int. Cl.³ F16K *11/04*
U.S. Cl. 137—625.5 **3 Claims**

1. An improved continuous flow, reversible flow direction valve assembly, said assembly comprising, in combination:

(a) an elongated housing defining an elongated central passageway and having a plurality of separate spaced ports in the sidewall thereof along the length thereof in communication with said passageway;

(b) an elongated drive shaft disposed longitudinally in said passageway and movable between a resting position and an actuated position;

(c) first coil springs around said shaft in said housing biasing said shaft into said resting position;

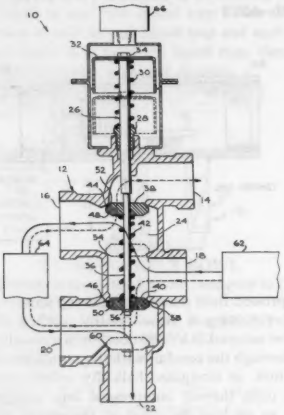
(d) a plurality of valve openings defined by said housing along the length of said passageway, said valve openings providing communication between adjacent ones of said ports;

(e) a plurality of free floating valve sealing elements disposed transversely on, secured to and spaced along said shaft in said housing, each said valve sealing element being disposed between two adjacent ones of said valve opening and including two peripheral annular valve sealing surfaces on opposite sides thereof, said shaft including detents

to limit the longitudinal movement of said valve sealing elements on said shaft;

(f) second coiled springs in said housing around said shaft biasing said valve sealing elements apart on said shaft;

(g) actuator means connected to said housing for movement of said shaft between said resting position wherein a first



spaced set of said valve openings is closed by said valve sealing elements and a second set of said valve openings is open for fluid flow through said valve in a first direction, and said actuated position wherein said second separate spaced set of said valve openings is closed by said valve sealing elements and said first set of valve openings is open for fluid flow through said valve in a second direction.

4,319,608

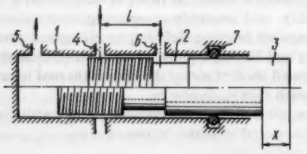
LIQUID FLOW SPLITTER

Ivan Y. Raikov, ulitsa B. Galushkina, 26, kv. 34; Pavel A. Ivaschenko, ulitsa Glebovskaya, 4, kv. 51, and Igor V. Samolovsky, ulitsa B. Spasskaya, 1/2, korpus 2, kv. 9, all of Moscow, U.S.S.R.

Continuation of Ser. No. 792,557, May 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 745,423, Nov. 26, 1976, abandoned, which is a continuation of Ser. No. 393,138, Aug. 30, 1973, abandoned. This application May 18, 1979, Ser. No. 40,221

Int. Cl.³ F16K *21/02*; F15D *1/14*

U.S. Cl. 137—625.48 **1 Claim**



1. A liquid flow splitter for splitting an initial flow of liquid into at least three essentially isolated streams of liquid comprising:

a casing;

a cylindrical chamber in said casing, said cylindrical chamber having a substantially smooth cylindrical inner peripheral surface;

a throttling member slideably fitted within said casing;

said throttling member including a cylindrical portion abutting said inner peripheral surface;

first and second continuous interlaced helical grooves on an outer cylindrical peripheral surface of said cylindrical portion, said first and second continuous interlaced helical grooves extending from one end of said cylindrical portion to a second end thereof;

means for permitting linear movement of said cylindrical portion without rotation between first and second axial positions in said cylindrical chamber;

an inlet passage adapted for the passage of an initial flow of liquid into said cylindrical chamber;

said inlet passage being positioned to impinge said initial flow of liquid directly on said first and second continuous helical grooves at all axial positions of said cylindrical portion between said first and second positions whereby liquid impinging on said helical grooves is split to flow in opposite directions between said helical grooves and said cylindrical inner peripheral surface until said liquid exits said first and second continuous helical grooves at first and second opposed ends thereof;

a first outlet passage spaced axially a first distance in a first direction along said cylindrical chamber from the said inlet passage, said first distance exceeding a maximum position of said cylindrical portion in said first direction;

second and third outlet passages spaced axially from said inlet passage a second distance in a second direction opposite to said first direction along said cylindrical chamber, said second distance exceeding a maximum position of said cylindrical portion in said second direction;

said second and third outlet passages being circumferentially spaced about said cylindrical chamber;

a first flow passage from an end of said first helical groove at said second end of said cylindrical portion to said second outlet passage;

a second flow passage from an end of said second helical groove at said second end of said cylindrical portion to said third outlet passage;

means for substantially isolating flow of liquid between said first and second flow passages;

said first outlet passage being adapted for feeding back liquid therefrom to rejoin said initial flow of liquid; and

said second and third outlet passages being adapted for feeding liquid therefrom to first and second users respectively.

4,319,609

FIVE-POSITION HYDRAULIC ACTUATING APPARATUS

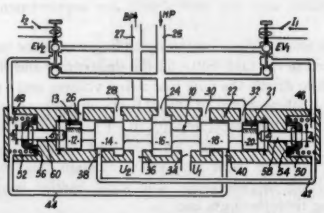
Philippe Debrus, Paris, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Apr. 7, 1980, Ser. No. 137,740

Claims priority, application France, Apr. 6, 1979, 79 08814

Int. Cl.³ F15B *13/043, 11/12*

U.S. Cl. 137—625.63 **8 Claims**



1. Hydraulic actuating apparatus with digital input, of the type comprising a movable output member occupying, when at rest, a neutral position towards which it is urged by resilient centring means and capable of moving in opposition to these last to both sides of the said neutral position so as to occupy one or other of two working positions defined by stop means,

the displacements of this movable member being caused by opposing hydraulic actuating means each allocated to one direction of displacement and themselves selectively controlled by two two-position control members receiving input commands of a digital nature, characterized by the fact that, to create without resorting to additional control means two additional working positions for the movable output member which are also defined by stop means and to thus obtain five different positions of equilibrium by means of only four binary control words, each of the hydraulic actuating means is composed of two active areas (s_1, s'_1; s_2, s'_2) acting in the same direction on the movable output member (10) and coming into action one after the other so as to transmit two successive displacement steps to the said member, the putting under pressure of the first (s_1; s_2) of these areas being caused by one (EV_1; EV_2) of the two control members, and that of the second area (s'_1; s'_2) by the other control member (EV_2; EV_1), this only being made possible, however, when the movable member has already completed a first displacement step in the direction concerned.

4,319,610

PROCESS FOR COATING METAL TUBES AND USE OF THE COATED TUBES

Günter Eckner, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 3, 1980, Ser. No. 193,800

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1979, 2940388

Int. Cl.³ F16L *11/14*

U.S. Cl. 138—131 **11 Claims**

1. A process for coating preheated metal tubes with polyethylene in at least two steps, wherein a metal tube which has been preheated to a temperature of at least 200° C. and at most 250° C. is coated in a first step with polyethylene having a melt index between 1.2 and 70 g/10 min. (190° C./2.16 kg), the coating is cooled in a second step to a temperature between 110° and 170° C., and subsequently in a third step a self-supporting film of polyethylene having a melt index between 0.1 and 7 g/10 min is applied by winding round the tube at a temperature between 110° and 170° C. so that the total coating has a minimum thickness of 1.5 to 4 mm.

4,319,611

PICKING COMB FOR JET LOOMS

Jan Foltyn, Brno; Vladimir Kuda, Blazovice; Vladimir Vasicek, Moravsky Krumlov, and Jaroslav Koci, Brno, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu, Brno, Czechoslovakia

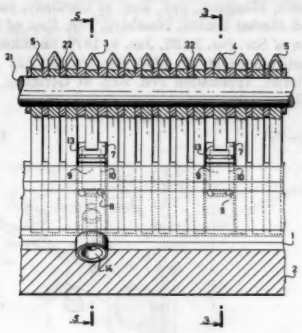
Filed Mar. 28, 1980, Ser. No. 135,115

Claims priority, application Czechoslovakia, Mar. 28, 1979, 2046-79

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 **4 Claims**

1. A picking comb particularly for jet looms, comprising a carrier means adapted to be attached to a sley, guide teeth secured with their mounting portions, the mounting portion being mounted on the carrier means, at least one of the guide



teeth having its picking portion detachable from its mounting portion.

4,319,612

METHOD OF WASHING AND FILLING CONTAINERS

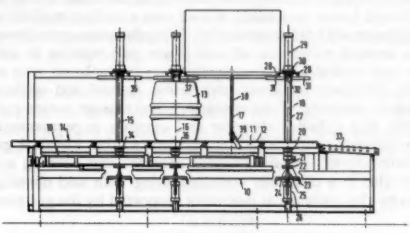
Cyril G. Golding, Sedgley, England, assignor to GKN Sankey Limited, Telford, United Kingdom

Filed May 7, 1980, Ser. No. 147,536

Claims priority, application United Kingdom, May 12, 1979, 16582/79

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—1 **6 Claims**



1. A method of washing the interior of a container and then filling the container with liquid under top pressure of a gas, characterized by the steps of subjecting the interior of the container to a first wash at a first washing station; moving the container to a second washing station, subjecting the interior of the container to a second wash at said second station and then filling the container with steam and gas at said second station, and sealing the container; and moving the container to a filling station, unsealing and filling the container at said filling station with liquid which displaces said gas through a pressure relief valve, and finally sealing the filled container.

4,319,613

VALVE ARRANGEMENT FOR FILLING CONTAINERS WITH GAS-CONTAINING LIQUID

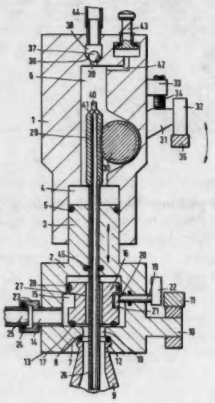
Manfred Mette, Hamburg, Fed. Rep. of Germany, assignor to Ortmann & Herbst GmbH, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 2,185, Jan. 9, 1979, abandoned. This application Oct. 27, 1980, Ser. No. 201,322

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1978, 2800972

Int. Cl.³ B65B *31/00*

U.S. Cl. 141—39 **10 Claims**



1. A filling valve for filling a gas-pressurized liquid into containers, comprising at least one cylinder-piston unit including at least one stationary head part and at least one vertically reciprocable lower part, one of said parts having a cylinder chamber adapted to receive gas under pressure and the other of said parts having a piston portion slidable in said cylinder chamber and having a crosssectional area larger than that bounded by a rim surrounding the inlet of a container to be filled said lower part having a valve chamber and an opening to receive a container to be filled, a liquid-controlling valve disposed in said valve chamber and movable with said lower part; a liquid inlet associated with said valve chamber; a liquid outlet disposed between said valve chamber and said opening to receive a container; a sealing element arranged in said opening so as to be in contact with the rim of the container to be filled, said lower part being moved into a sealing position in engagement with the container for filling the same upon downward vertical movement of said lower part relative to said head part so that a filled container may be replaced with an empty container by lateral movement thereof and without raising or lowering of the containers; and passage means connecting said cylinder chamber and opening in permanently open communication with one another, so that identical gas pressure prevails in said cylinder chamber and opening and hence also in a container communicating with said opening, whereby the container is internally supported by the gas pressure.

4,319,614

SALAD DRESSING BOTTLE AND TOP STOPPER WITH INDIVIDUAL SERVER

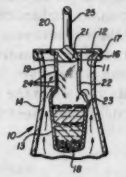
William E. Boice, 1708 Japonica La., Plano, Tex. 75074

Filed Mar. 28, 1980, Ser. No. 134,861

Int. Cl.³ B65B *3/30*

U.S. Cl. 141—381 **8 Claims**

1. A salad dressing bottle with an individual server equipped top stopper including: a bottle with a salad dressing reservoir portion having a bottom shaped to hold the bottle in an upright position when placed on a flat supporting surface; an upper neck extension from said reservoir portion terminating in an upper neck lip rim defining a bottle opening subject to being selectively closed and opened with a stopper; a stopper shaped to close the bottle opening; an individual server in the form of a cup suspended from the bottom of said stopper within said bottle upper neck extension when said stopper is in place closing said bottle opening and freely removable from said bottle with said stopper when the stopper is removed with the individual server for the pouring of salad dressing therefrom to an individual salad; opening means in said cup for proper distribution of salad dressing ingredients entering the individual serving cup with tilting and shaking of the bottle and the stopper in



place closing said bottle opening and the individual server in the upper neck extension of the bottle, wherein said cup suspended from the bottom of said stopper includes a lower cup body and a neck portion interconnecting said lower cup body and said bottom of said stopper and fastening means between said cup and said stopper;

wherein said opening means includes an opening positioned in said neck portion defining at the lower extent of said opening a pouring lip at the top of said lower cup body; and wherein said opening means also includes a plurality of openings in said neck portion in addition to said opening with the pouring lip at the top of said lower cup body.

4,319,615

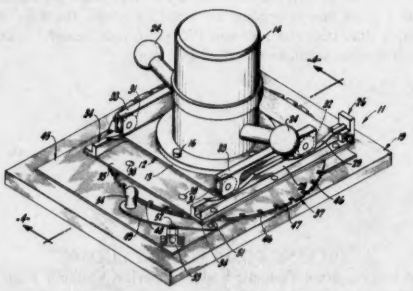
ROUTER ATTACHMENT FOR ORNAMENTING A WORKPIECE

Henry A. Ditmanson, Medford, Oreg., assignor to Robert C. Ditmanson; Richard A. Ditmanson, both of Sacramento, Calif. and Helen Donaldson, Medford, Oreg.

Filed Dec. 22, 1980, Ser. No. 218,708

Int. Cl.³ B27C *5/10*

U.S. Cl. 144—144 R **2 Claims**



1. A router attachment for ornamenting a planar workpiece comprising:

a. a base plate supported in face to face engagement by the workpiece, said base plate having a circular opening to provide access to the subjacent workpiece to be ornamented;

b. an annular boss mounted on top of said base plate concentrically around the periphery of said circular opening;

c. an annular turntable having a central circular aperture with a diameter slightly greater than the outer diameter of said boss to enable said turntable to circumscribe said boss and rotate relative thereto with accurate concentricity, the outer perimeter of said turntable being notched at equal angular increments;

d. a track including a rail plate with a central circular perforation approximately the size of said circular opening in said base plate, and a pair of parallel rails mounted on said rail plate and straddling said perforation, the tops of said rails being formed with contours;

e. means for securing said track on said turntable so that said perforation is concentric with respect to said aperture;

f. a carriage including a flat bed and upstanding side walls having wheels mounted thereof for rolling engagement with the contoured tops of said rails, said carriage rising or falling in accordance with the contour shapes and sizes;

g. means for mounting a router on said carriage with the router bit extending toward the workpiece area exposed through said perforation and said opening, the contours of said tops of said rails having a range of elevations sufficient to lower the router bit into cutting engagement with the workpiece for at least a portion of the length of said rails; and,

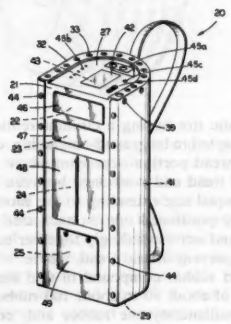
h. detent means for selectively engaging at least one of said notches at a time to position said turntable, said track, said carriage and the router at a predetermined azimuth relative to the workpiece, said detent means including a lever pivotally mounted on said base plate, a tooth mounted on said lever adjacent said turntable for engagement with one of said notches at a time, and a spring biasing said lever and said tooth toward said outer perimeter of said turntable and into engagement with a registering one of said notches.

4,319,616

GOLF CLUB CARRIER

Richard D. Light, 1500 E. 82nd St., Indianapolis, Ind. 46240

Filed Aug. 4, 1980, Ser. No. 174,810
Int. Cl.³ A63B *55/02*
U.S. Cl. 150—1.5 C **6 Claims**



1. A golf club carrier comprising:

an elongate inner member arranged into a plurality of rigid, separate compartments, wherein said elongate inner member has at least one substantially flat surface, said plurality of rigid, separate compartments being disposed in said one substantially flat surface; and

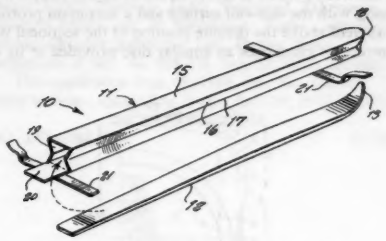
golf club-receiving means disposed around and exterior to said elongate inner member for holding golf clubs in an accessible manner, said golf club-receiving means including an upper lip portion outwardly extending from the exterior of said elongated inner member and a lower shelf portion, said upper lip portion including a spaced plurality of club shaft-receiving apertures.

4,319,617

AUTO TRAVEL SKI BAG

Louis V. Fusaro, 7 Mallard La., Smithtown, N.Y. 11787

Filed Jun. 30, 1980, Ser. No. 164,182
Int. Cl.³ A45C *11/00*
U.S. Cl. 150—52 R **1 Claim**



1. An auto travel ski bag for carrying one ski of a pair of skis comprising, an elongated casing made of a flexible material, said elongated casing having a longitudinal upper face, a longitudinal lower face parallel with said longitudinal upper face, a first side edge surface extending between said upper and lower longitudinal faces from first edges thereof, a second side edge surface extending between said upper and lower longitudinal faces from second edges thereof, said first and second side edge surfaces being parallel with each other when said casing is in its opened ski-receiving position, each of said first and second side edge surfaces having a first longitudinal portion and a second longitudinal portion, said first and second longitudinal portions being connected to each other at a fold line, each said fold line being positioned relative to the side edge of a respective upper and lower longitudinal face such that each said fold line is offset in a direction toward the opposite side edge surface from a plane containing therein said respective side edges of the upper and lower longitudinal faces, each said fold line causing said first and second longitudinal portions of each said side edge surface to extend at an angle to each other with said fold line being the apex of said angle, so that said side edge surfaces have the tendency to collapse inwardly toward each other and thus collapse said casing in an accordian-like manner; said casing further having a front open end and rear curved end, said front open end receiving therethrough a ski for storing in said casing; said casing further comprising a front lid attached to one of said lower and upper longitudinal faces at a front edge thereof; and means for securing the ski within said casing after insertion therein, said means for securing being attached on the exterior of said casing; said fold lines dividing the interior of said casing into an upper and a lower compartment, one of said compartments receiving therein the ski while the other compartment is closed off by said means for securing after entry of the ski in said one compartment; and said rear curved end being fully extended with the ski in said first compartment, said curved rear end receiving therein the curved portion of the ski.

4,319,618

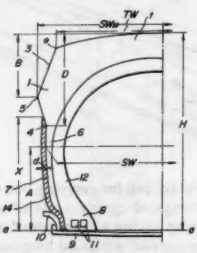
PNEUMATIC TIRE WHEEL FOR USE IN OFF-ROAD VEHICLES

Yasuo Suzuki, Akigawa, Japan, assignor to Bridgestone Tire Company, Limited, Tokyo, Japan

Filed Apr. 28, 1980, Ser. No. 144,106
Claims priority, application Japan, May 8, 1979, 54/61030[U]
Int. Cl.³ B60C *13/00, 19/12*
U.S. Cl. 152—185 **6 Claims**

1. A pneumatic tire wheel for use in off-road vehicles with a tire comprising a pair of bead portions, a pair of side portions and a tread portion is assembled into a rim together with a protector extending outward from the bead portion along the sidewall surface of at least one side portion toward the radial

direction of the tire, the improvement comprising; a carcass of radial construction, a protrusion projecting over tread width and sectional width of the tire toward the widthwise direction thereof under an inflation pressure integrally united with each of the side portions in the vicinity of the outer surface of the side portion above a definite position of the sectional width and near the tread portion to locate an inside base of the protrusion crossing with the sidewall surface and a maximum protruding part thereof above the definite position of the sectional width; the protector comprises an annular disc provided at its inner



periphery with an annular seat firmly sandwiched between the bead portion of the tire and a flange of the rim and extending along the sidewall surface up to the inside base of the protrusion and made from rubber or rubbery material; and the annular seat of the protector and rubber skin at the sidewall surface of the side portion has a wear resistance higher than that of the remaining disc part of the protector, wherein the wear resistance is reduced in the order of the annular seat of the protector, the rubber skin at the sidewall surface of the side portion and the disc part of the protector.

4,319,619

RADIAL-PLY TIRE HAVING LOW ROLLING RESISTANCE

Masatoshi Kozima, Hiratsuka; Akinori Tokieda, Yokohama; Tadanobu Nagumo, Hiratsuka, and Masaru Hirai, Yokohama, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1980, Ser. No. 132,123
Claims priority, application Japan, Mar. 23, 1979, 54-33945
Int. Cl.³ B60C *1/00, 5/14, 9/02*
U.S. Cl. 152—209 R **2 Claims**

1. A radial-ply tire having:

at least one carcass ply consisting of a plurality of cords arranged at an inclination angle of 70° to 90° to the equator plane of the tire, said carcass ply being retained at its both ends by means of bead wires;

a belt layer for reinforcing the portion of said carcass ply behind the tread, said belt layer being disposed between the tread and the carcass ply;

an undertread layer disposed at the outside of said belt layer;

an inner liner layer disposed at the innermost portion of the tire; and

an outer liner layer disposed adjacent to the outer surface of said inner liner layer;

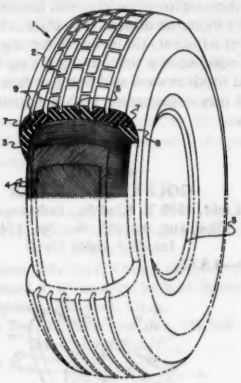
wherein the improvement comprises that the rubber portion of at least one of said carcass ply and said undertread has a visco-elastic property of loss tangent, tan δ, of 0.2 or lower (tan $\delta \leqq 0.2$) and storage modulus, G, of 120 kg/cm^2 or higher ($G \geqq 120$ kg/cm^2) measured by a shearing vibration at a frequency of 50 H_z and a dynamic strain of 5% under a temperature of 40° C. and is a rubber which is formed by adding 2.50 to 3.50 weight parts of sulfur, 1 to 2 parts of vulcanization accelerator of sulfenamide group and 40 to 65 weight parts of carbon black having a mean particle size of 25 to 77 mμ to 100 weight parts of at least one vulcanizable rubber which is selected from the group consisting of natural rubber, diene rubber and diene copolymer rubber.

4,319,620

PNEUMATIC TIRE HAVING AXIALLY VARYING TREAD COMPOSITION

Robert B. Knill, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 19, 1980, Ser. No. 189,392
Int. Cl.³ B60C *1/00, 11/00*
U.S. Cl. 152—209 R **2 Claims**



1. A pneumatic tire having a circumferential, sulfur-cured rubber tread adapted to be ground-contacting, comprised of an axially central tread portion occupying about 30 to about 55 percent of said tread and positioned between two tread portions of about equal size extending to the shoulder regions of said tire, axially positioned one on each side of said central tread portion, and correspondingly together occupying about 70 to about 45 percent of said tread, where

(A) the cured rubber compound of said central portion is composed of about 60 to about 100 rubber hydrocarbon (RHC) butadiene/styrene rubber and, correspondingly, about 40 to about 0 RHC cis-1,4-polybutadiene rubber, characterized by having a hot rebound value in the range of about 55 to about 65 and a Shore A hardness in the range of about 58 to about 78 and further characterized, when a part of said tread on said pneumatic tire in its inflated state, by having tread wear, rolling resistance, and wet skid resistance values individually normalized to a value of 100; where

(B) the cured rubber of said outer tread portions is composed of about 80 to 50 RHC natural and/or cis-1,4-polyisoprene rubber and correspondingly, about 20 to about 50 RHC 1,4-polybutadiene rubber, characterized by having a hot rebound value in the range of about 70 to about 85 and a Shore A hardness in the range of about 52 to about 65 and

further characterized, when a part of said tread on said pneumatic tire in its inflated state, by having, as compared to the normalized values of said central tread portions, a tread wear value in the range of about 75 to about 110, rolling resistance value in the range of about 120 to about 140 and a wet skid resistance value in the range of about 80 to about 95; and where

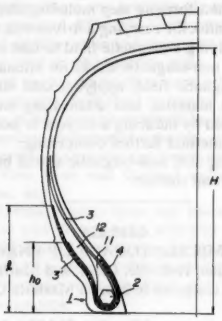
(C) said overall tread composite on said pneumatic tire in its inflated state is characterized by having, as compared to the normalized values of said normalized central portion, a tread wear value in the range of about 90 to about 110, a rolling resistance value in the range of about 105 to about 135 and a wet skid resistance value in the range of about 90 to about 100; and where the rubber of the supporting carcass is at least one of a sulfur-cured rubber selected from natural rubber, synthetic cis-1,4-polyisoprene, cis-1,4-polybutadiene and butadiene/styrene copolymers.

4,319,621

PNEUMATIC RADIAL TIRE HAVING AN IMPROVED BEAD PORTION REINFORCING CONSTRUCTION

Kenichi Motomura, Higashi-Murayama; Shigeo Watanabe, Kokubunji, and Toshiyuki Sogi, Higashi-Yamato, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 808,947, Jun. 22, 1977, abandoned. This application May 21, 1979, Ser. No. 40,823
Claims priority, application Japan, Jun. 22, 1976, 51-72714
Int. Cl.³ B60C *15/06*
U.S. Cl. 152—362 CS **1 Claim**



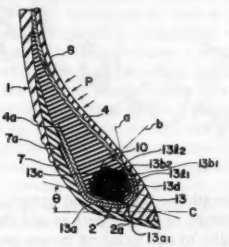
1. A pneumatic radial tire having an improved bead portion reinforcing construction comprising; a carcass body having substantially radially arranged ply cords; a belt for reinforcing a crown portion of said carcass body; and a bead portion reinforcing band disposed along a bead portion formed by folding the ply of said carcass body around a bead ring;said bead portion reinforcing band comprising at least one chipper layer; said chipper comprising an extensible reinforcing element embedded in rubber and formed of from 2 to 30 helically formed metal filaments without twisting; said reinforcing element having a modulus of elasticity of 0.029×10^4 kg/mm^2 to 1.60×10^4 kg/mm^2 and a compression modulus of elasticity of 20 to 300 kg/mm^2; each of said filaments having a diameter within the range of 0.1 to 1.0 mm; the ratio of maximum diameter to minimum diameter of said filaments in an outer contour projected on a plane perpendicular to the axial direction of one pitch of the filaments being within the range of 1 to 1.5; the ratio of an average diameter of an outer contour of each of said filaments projected on a plane perpendicular to the axial direction of one pitch of the filament to the filament diameter is within a range of 2 to 20; the rubber of said chipper having a 100% modulus of elasticity of 20 to 90 kg/cm^2;and said reinforcing element being embedded in said rubber at ends of 10 to 50 elements5 cm and inclined with respect to the ply cords of said carcass body to make said chipper as a whole extensible but otherwise rigid.

4,319,622

PNEUMATIC TIRE WITH IMPROVED BEAD CONSTRUCTION

Munenori Iuchi; Tsutomu Iseki; Yoshinori Takeyama, and Masuhiro Ohira, all of Shirakawa, Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Continuation of Ser. No. 918,035, Jun. 22, 1978, abandoned. This application Aug. 18, 1980, Ser. No. 179,013
Claims priority, application Japan, Jun. 29, 1977, 52/78314
Int. Cl.³ B60C *15/04*
U.S. Cl. 152—362 R **8 Claims**



1. A pneumatic tubless tire for use on a motor vehicle which comprises a tire cover made of a rubber material and having a tread portion, a pair of opposed side walls extending integrally from respective side edges of the tread portion, a pair of opposed bead portions extending integrally from respective free ends of the individual side walls and each having a bead base portion to be fitted onto a wheel rim, bead cores respectively embedded in the bead portions, each bead core composed of a plurality of layers of bead wires, each layer being constituted by turns of bead wires, piled up one layer upon another to form said bead cores having polygonal cross sections, one side of said polygonal cross section at the lowest layer of the plurality of layers being substantially parallel to the bead base portion, and a carcass embedded in the tire cover adjacent to the inner surface thereof and turned up at opposite ends thereof, around the bead cores, the number of layers of bead wire and the number of turns of bead wire in each layer, from the lowest layer thereof, being arranged in the order of

$$N,N+1,N+2,\ldots,N+M,N+(M-1),N+(M-2),\ldots,\text{and } N+(M-L)$$

wherein the integral numbers N, M and L are set within the following ranges:

$$7\leqq N\leqq 11$$

$$2\leqq M\leqq 4$$

$$(M+1)\leqq L\leqq (M+4).$$

4,319,623

WINDOW STRUCTURE INCLUDING A SHEET OF POLYMERIC FILM

Gerald P. Krogseng, Oakdale; Joseph G. Mandell, St. Paul, and George L. Ruth, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

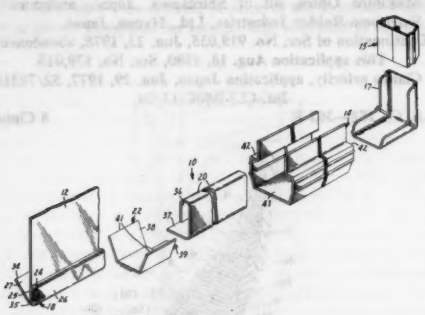
Filed Jan. 14, 1980, Ser. No. 112,119
Int. Cl.³ A47H *23/00, 13/00*
U.S. Cl. 160—90 **11 Claims**

1. A structure for supporting a sheet of polymeric film be-

tween a pair of opposed and spaced frame channels comprising:

grasping means fastened to said film along two of its opposing edges for continuously securing said film along the entire length of said opposing edges,

retainer means having portions defining a receptacle to receive and support each of said grasping means along its



entire length for holding said grasping means in a plane and generally in a linear path in said plane and for providing rigidity to said grasping means, and

biasing means joined to said retainer means and adapted for attachment to said channels for tensioning said film between said spaced channels and to compensate for dimensional changes occurring between said film and said channels to maintain the film flat.

4,319,624

CLEANING MACHINE FOR CASTINGS

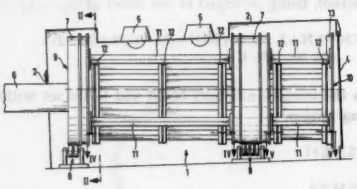
Martin Weis, Ettlingen, and Hermann Dumbs, Gernsbach, both of Fed. Rep. of Germany, assignors to ARENCO-BMD Maschinenfabrik GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Aug. 4, 1980, Ser. No. 174,746

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1979, 2931578

Int. Cl.³ B22D *29/00*

U.S. Cl. 164—401 **16 Claims**



1. In a cleaning machine for castings with a cleaning drum having an inlet opening at one end, an outlet opening at an opposite end and a longitudinally extending blast opening, means for supporting said drum for rotation about a longitudinal axis with the drum sloping downwardly from the inlet opening to the outlet opening, a driving system for oscillating said drum about said longitudinal axis through an angle of 120°, and at least one abrasive throwing wheel mounted stationarily over said blast opening, the improvement comprising said drum having a wall structure of polygonal cross-section including two floor parts located opposite said blast opening which meet and form an angle of about 120° with respect to each other and a plurality of side wall parts defining said wall structure between said floor parts and said blast opening.

4,319,625

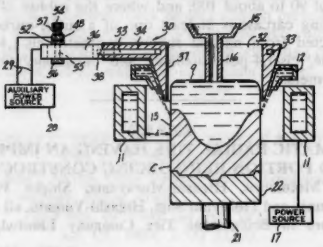
ELECTROMAGNETIC CASTING PROCESS UTILIZING AN ACTIVE TRANSFORMER-DRIVEN COPPER SHIELD

Peter J. Kindlmann, Northford; John C. Yarwood, Madison; Gary L. Ungarean, Woodbridge, and Derek E. Tyler, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 111,485, Jan. 14, 1980, Pat. No. 4,285,387. This application Feb. 4, 1981, Ser. No. 231,197

Int. Cl.³ B22D *27/02*

U.S. Cl. 164—467 **10 Claims**



1. In a method for continuously and semi-continuously casting materials comprising:

electromagnetically containing and forming said molten materials into a desired casting, said electromagnetically containing and forming step including the steps of:

providing an inductor carrying a driven current for generating and applying a magnetic field to said molten material; providing a non-magnetic shield for attenuating and shaping said magnetic field; applying said magnetic field to said molten material; and attenuating and shaping said magnetic field by inducing a current in said non-magnetic shield; said method further comprising:

actively driving said non-magnetic shield by establishing a bucking current therein.

4,319,626

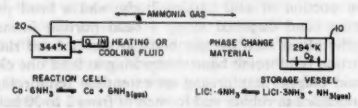
CHEMICAL STORAGE OF ENERGY

Harold A. Papazian, Holtville, Calif., and Murlin T. Howerton, Denver, Colo., assignors to Martin Marietta Corp., Bethesda, Md.

Continuation-in-part of Ser. No. 702,838, Jul. 6, 1976, abandoned. This application Jun. 24, 1977, Ser. No. 809,647

Int. Cl.³ F23D *21/00*

U.S. Cl. 165—1 **17 Claims**



1. A method of storing energy and recovering same on demand, which energy storage steps comprise:

(a) Providing, in an enclosed reaction zone, a first chemical compound which reacts solely upon the application of thermal energy thereto to produce a gas and a second chemical compound,

(b) Providing, in an enclosed storage zone, a third chemical compound which reacts solely upon the application of thermal energy thereto to produce a gas and a fourth chemical compound, both of the reactions involving said first and third chemical compounds being reversible, having essentially the same equilibrium vapor pressure at two different temperatures, and producing a gas which is a common reactant or product in said reversible chemical

reactions, such that by a change in temperature the equilibrium can be shifted to dissociate or recombine said gas in each of said reactions, said reaction and storage zones being in continuous open communication, whereby said gas can flow freely between said zones,

(c) Providing a thermal energy storage means,

(d) Supplying a source of thermal energy to said reaction zone to raise the temperature of said reaction zone and said first chemical compound, whereby said first chemical compound will react to evolve said gas and said second chemical compound and whereby the pressure in said reaction zone is increased higher than the pressure in said storage zone and a pressure differential results between said zones and causes said gas to flow from said reaction to said storage zone,

(e) Flowing said gas to said storage zone,

(f) Reacting said gas with said fourth chemical compound to form said third chemical compound and to evolve thermal energy and thereby raise the temperature of said storage zone, whereby a temperature differential will result between said storage zone and said thermal energy storage means and cause the evolved thermal energy to flow from said storage zone to said thermal energy storage means, and

(g) Storing the thermal energy evolved in said storage zone in said thermal energy storage means, whereby the thermal energy from the source will be stored and the pressure between said reaction and storage zones and the temperature between said storage zone and said thermal energy storage means will become equalized, and

which energy recovery steps comprise:

(h) Drawing thermal energy from said reaction zone to lower the temperature and pressure of said reaction zone, whereby a pressure differential will result between said reaction and storage zones and cause said gas to flow from said storage zone to said reaction zone,

(i) Flowing said gas to said reaction zone, whereby said third chemical compound will react to evolve said gas and the temperature in said storage zone will be lowered resulting in a temperature differential between said storage zone and said thermal energy storage means and cause thermal energy to flow from said thermal energy zone to said storage zone, and

(j) Flowing thermal energy from said thermal energy storage means to said storage zone, whereby the temperature between said thermal energy storage means and said storage zone and the pressure between said storage and reaction zones will become equalized and whereby stored energy is recovered.

4,319,627

CHEMICAL STORAGE OF ENERGY

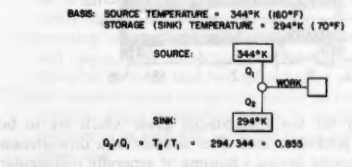
Harold A. Papazian, Yuma, Ariz., and Murlin T. Howerton, Denver, Colo., assignors to Martin Marietta Corp., Bethesda, Md.

Continuation of Ser. No. 702,838, Jul. 6, 1976, abandoned. This application Apr. 12, 1978, Ser. No. 895,606

The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.

Int. Cl.³ F28D *21/00*

U.S. Cl. 165—1 **1 Claim**



1. A method of storing energy and recovering the same on demand which energy storage steps comprise providing a first chemical compound, which is an ammoniate of ferrous chloride, in a closed reaction zone which compound upon application of thermal energy thereto solely endothermically decomposes into an ammonia gas and a second chemical compound, which is an ammoniate of ferrous chloride, supplying thermal energy to said reaction zone containing said first chemical compound to raise the temperature of the reaction zone and to evolve ammonia gas from the first chemical compound under positive pressure, providing a third chemical compound, which is an ammoniate of calcium chloride, in a separate closed storage zone freely communicating said reaction zone, which third compound is adapted to solely exothermally combine with the ammonia gas evolved by said first compound at substantially ambient temperature, transferring the evolved gas to the storage zone under slight positive pressure reacting the evolved gas with the third compound to evolve thermal energy and to form a fourth chemical compound, which is an ammoniate of calcium chloride, providing a thermal energy storage means, absorbing the thermal energy evolved by said third compound in the thermal storage means and the energy recovery steps comprise absorbing thermal energy from the reaction zone lowering the pressure therein and in the storage zone communicating therewith, causing the fourth compound to solely endothermically decompose at substantially ambient temperature and absorb thermal energy from the thermal storage means as the ammonia gas evolved from the fourth compound is transferred under slight positive pressure to the reaction zone and reacts solely exothermally with the second compound in the reaction zone to evolve thermal energy at a high temperature and wherein the gas pressure in the reaction zone is equal to the gas pressure in the storage zone under static conditions of no energy transfer.

4,319,628

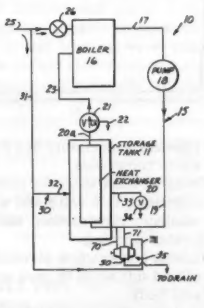
TWO LIQUID HEAT EXCHANGE SYSTEM AND SAFETY VALVE TO PREVENT CONTAMINATION

R. Lyle Hughes, Covina, Calif., assignor to Southern California Gas Company, Los Angeles, Calif.

Filed Jul. 13, 1979, Ser. No. 57,271

Int. Cl.³ G05D *23/00*

U.S. Cl. 165—39 **8 Claims**



1. A two liquid heat exchanger system comprising

a first liquid circuit comprising a boiler, a circulating pump, a heat exchanger, and conduitry to circulate a first liquid through them;

a second liquid circuit including an enclosure which encloses said heat exchanger, said enclosure having an inlet and an outlet for supplying second liquid under presssure to said enclosure and for removing it therefrom, said second circuit being adapted to be supplied with liquid under pressure; and

a safety valve comprising a valve body having a cavity therein, a first diaphragm and a second diaphragm, said diaphragms being spaced from one another, whereby to

divide said cavity into a first, a second, and a third chamber, with the first diaphragm separating the first and second chambers, and with the second chamber between the first and third chambers, a first liquid sensor port passing through said body and entering said first chamber, a first liquid entry port and a first liquid drain port both passing through said body and entering said second chamber, a second liquid sensor port passing through said body and entering said third chamber, a valve seat in said second chamber, and a conduit interconnecting said first liquid entry port to said valve seat, whereby liquid entering said first liquid entry port can flow through said conduit and said valve seat into said second chamber, a valve closure in said second chamber facing said valve seat, a rigid link connected to both of said diaphragms, said valve closure being mounted to said rigid link, said diaphragms being flexible, whereby to enable said link to move said valve closure against said valve seat to close said conduit or to move it away from said valve seat to open said conduit, and bias means biasing said valve closure toward its said open condition, whereby said valve closure remains in said open condition unless and until the pressure in said third chamber exceeds the pressure in said first chamber by a difference sufficient to cause the net force generated on said diaphragms to overcome the force of said bias means and press said valve closure against said valve seat, said first circuit being connected to said first liquid sensor port and to said first liquid entry port, and said second circuit being connected to said second liquid sensor port.

4,319,629

CONSTANT TEMPERATURE BOX

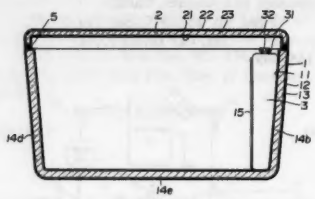
Masashi Hotta, Osaka, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Division of Ser. No. 32,868, Apr. 24, 1979, abandoned. This application Jan. 19, 1981, Ser. No. 226,094

Claims priority, application Japan, Apr. 29, 1978, 53-57979

Int. Cl.³ F25D *3/08*; F24H *7/00*; A47G *23/04*

U.S. Cl. 165—47 **4 Claims**



1. A portable constant temperature box for keeping inserted objects cold or warm comprising:

(a) a body defining an inner space for receiving said objects, said body comprising side walls and a bottom wall each having an adiabatic construction, said body having an upwardly directed opening;

(b) a lid of adiabatic construction pivoted to the upper portion of one of said side walls to open and close said upper opening of said body;

(c) means for tightly securing said lid to said body;

(d) a cooling or heating source holder housed within said body, said cooling or heating source holder being hollow and hermetically sealed for holding liquid which serves as a cooling or heating source, said holder comprising a first cooling or heating source container which abuts against one of said sidewalls of said box body and a second cooling or heating source container which abuts against the bottom of said box body, said first and second cooling or heating source containers being fluid connected together and being foldable at their interconnection, said first cooling or heating source container having a width substantially equal to an interval existing between opposite side walls of said body and a height substantially equal to the height of a side wall of said body, said cooling or heating source holder having a small thickness as compared with the inner space of said body and a flat-wall-like shape as a whole and, at one end face, an intake for said liquid and a stopper for closing said intake; and,

(e) support means for supporting said first cooling or heating source container upright and between opposite side walls within said body.

4,319,630

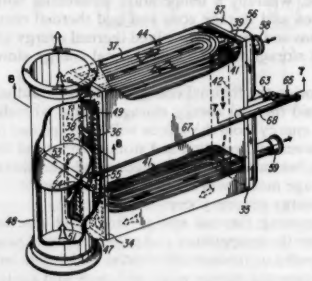
TUBULAR HEAT EXCHANGER

George Hronek, Dayton, and Richmond A. Gooden, Kettering, both of Ohio, assignors to United Aircraft Products, Inc., Dayton, Ohio

Filed Dec. 7, 1978, Ser. No. 967,473

Int. Cl.³ F28F *11/00*

U.S. Cl. 165—70 **6 Claims**



5. A tubular heat exchanger, including first and second tube means each bent substantially to a U configuration and orienting oppositely of one another so that ends of one tube means face in one direction and ends of the other tube means face in the opposite direction, first and second tube means being in a companion relation between their ends, companion tube means intermediate their ends being metallurgically bonded in a contacting relation to one another, longitudinally spaced apart header plates in respective ones of which ends of said tube means are received, means for manifolding a first fluid into and out of tube ends at a first header plate, and means for manifolding a second fluid into and out of tube ends at a second header plate.

4,319,631

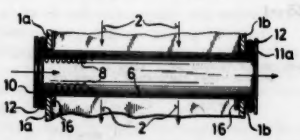
COOLER FOR HOT SMOKE-LADEN GASES

Adolf Margraf, Am Schleplingsbach 46, Stadthagen Wendthagen, Fed. Rep. of Germany

Division of Ser. No. 964,826, Nov. 30, 1978, Pat. No. 4,284,131. This application Oct. 14, 1980, Ser. No. 196,394

Int. Cl.³ F28F *9/06*

U.S. Cl. 165—76 **1 Claim**



1. A cooler for hot smoke-laden gases which are to be cleaned by a pocket or tube filter situated in a downstream location, the cooler having a housing of generally rectangular horizontal cross section through which the smoke-laden gas flows from top to bottom or from bottom to top, and which is

provided with cooling elements within the housing through which cold external air is conducted perpendicularly to the direction of flow of the smoke-laden gas around the cooling elements, and wherein:

the cooling elements are loose tubes of generally oval or flattened oval shape, which project through openings in two opposing walls of the cooler housing,

said tubes being arranged above one another and in parallel rows,

each cooling tube being solidly connected at one of its ends outside the cooler housing with an annular flange, an external loose annular flange provided at the other end, and said loose annular flange being connected to one end of a spring having its other end anchored inside the cooling tube.

4,319,632

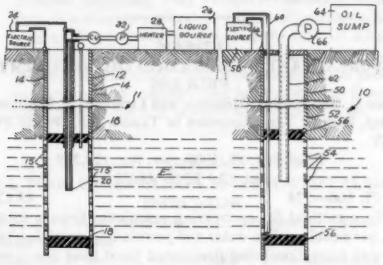
OIL RECOVERY WELL PARAFFIN ELIMINATION MEANS

Andrew W. Marr, Jr., Ardmore, Okla., assignor to GKJ, Inc., Lone Grove, Okla.

Continuation-in-part of Ser. No. 100,704, Dec. 4, 1979. This application Mar. 6, 1980, Ser. No. 127,901

Int. Cl.³ E21B *36/04, 43/24*

U.S. Cl. 166—60 **4 Claims**



1. An injection well comprising:

a bore hole having a perimeter and extending from ground surface level into or through an oil-bearing earth formation,

a casing being an electrically-conductive hollow casing extending along the perimeter of the bore hole from ground surface level to a level at or below the oil-bearing earth formation and having multiple perforations throughout a portion thereof adjacent the oil-bearing earth formation,

sealing means being two spaced-apart high-pressure-resistant plugs sealing the casing, the first such plug being at an elevation above and the second plug being at an elevation below at least a portion of the oil-bearing earth formation,

electrode means comprising means to conduct current into the bore hole from ground surface level through the first plug to a lower extremity in the space between the two plugs, said electrode means being externally electrically insulated from the ground surface level to and including the level of the first plug, but to a level which is significantly higher than the lower extremity,

connecting means electrically connecting said electrode to said casing, said connecting means being disposed at an elevation between said two spaced-apart plugs,

liquid conduit means comprising means to conduct a liquid pressure means comprising means to supply a liquid at a pressure of at least 400 psi to the space between the two plugs, and

an electric-power supply comprising means to produce an electric current flow through said casing, said connecting means and said electrode.

4,319,633

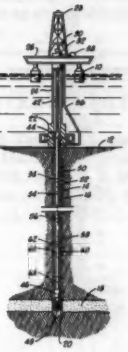
DRILL PIPE TESTER AND SAFETY VALVE

Michael E. McMahan, Duncan; Gerald D. Jackson, Marlow, and Burchus Q. Barrington, Duncan, all of Okla., assignors to Halliburton Services, Duncan, Okla.

Filed Apr. 3, 1980, Ser. No. 136,831

Int. Cl.³ E21B *34/08*

U.S. Cl. 166—250 **25 Claims**



1. A pipe tester valve, comprising:

a housing having a first end adapted to be connected to a string of pipe, and having a flow passage therethrough;

a spherical valve member disposed in said flow passage of said housing;

lug means, attached to said housing, for engaging said spherical valve member and rotating said spherical valve member between open and closed positions wherein said flow passage is open and closed, respectively, as said spherical valve member is moved axially relative to said housing and said lug means; and

moving means for moving said spherical valve member axially relative to said housing between its said open and closed positions, said moving means including:

a lower valve member seat means having a downward facing surface supportably engaged by an upward facing surface of said housing when said spherical valve member is in its said closed position, so that downward forces exerted on said spherical valve member in its said closed position due to fluid pressure in said string of pipe above said spherical valve member are transmitted to said housing through said engagement of said downward facing surface and said upward facing surface; and

latch means for latching said spherical valve member in its said closed position as said string of pipe and pipe tester valve are lowered into a well.

4,319,634

DRILL PIPE TESTER VALVE

Michael E. McMahan, and Burchus Q. Barrington, both of Duncan, Okla., assignors to Halliburton Services, Duncan, Okla.

Filed Apr. 3, 1980, Ser. No. 137,013

Int. Cl.³ E21B *34/08*

U.S. Cl. 166—250 **26 Claims**

1. A pipe tester valve, comprising:

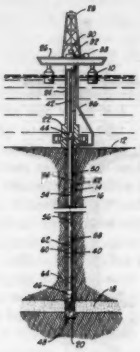
a housing having a first end adapted to be connected to a string of pipe, and having a flow passage therethrough;

a spherical valve member disposed in said flow passage of said housing;

lug means, attached to said housing, for engaging said spherical valve member and rotating said spherical valve member between open and closed positions wherein said flow passage is open and closed, respectively, as said spherical

valve member is moved axially relative to said housing and said lug means; and

moving means for moving said spherical valve member axially relative to said housing between its said open and closed positions, said moving means including lower valve member seat means having a downward facing surface supportably engaged by an upward facing surface of said



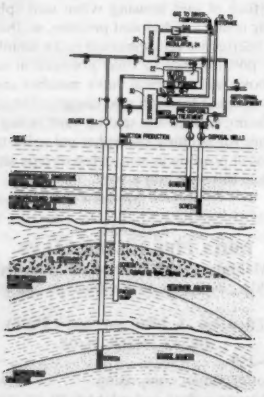
housing when said spherical valve member is in its said closed position, so that downward forces exerted on said spherical valve member in its said closed position due to fluid pressure in said string of pipe above said spherical valve member are transmitted substantially entirely to said housing through said engagement of said downward facing surface and said upward facing surface.

4,319,635

METHOD FOR ENHANCED OIL RECOVERY BY GEOPRESSURED WATERFLOOD

Paul H. Jones, Baton Rouge, La., assignor to P. H. Jones Hydrogeology, Inc., Baton Rouge, La.

Filed Feb. 29, 1980, Ser. No. 125,919
Int. Cl.[3] E21B *33/124, 43/18, 43/24, 43/40*
U.S. Cl. 166—263 28 Claims



1. A method for the enhanced recovery of petroleum from wells bored into an oil reservoir comprising:

(A) drilling a well so that it penetrates an oil reservoir;

(B) injecting water having a dissolved natural gas content at or near saturation at a temperature above 300° F. into the oil reservoir through the well bore at a flow rate sufficient to develop a back-pressure in the oil reservoir equal to between about 80% of its fracture pressure and a pressure below its fracture pressure; and

(C) producing oil through the well bore after the flow rate of injected water necessary to maintain the back-pressure below the oil reservoir fracture pressure drops below a predetermined level.

22. A system for the enhanced recovery of petroleum from wells bored into an oil reservoir comprising;

(A) a source well drilled into a geopressured source aquifer containing water having a temperature above 300° F. and having large quantities of natural gas dissolved or dispersed therein at saturation or near saturation levels, said source aquifer having a closed-in well-head pressure which exceeds the fracture pressure of an oil reservoir to be flooded;

(B) an injection-production well drilled into an oil reservoir;

(C) means for injecting water from the source well into the injection-production well through the well bore of the injection-production well at a flow rate sufficient to develop a back-pressure in the oil reservoir equal to between about 80% of its fracture pressure and a pressure below its fracture pressure; and

(D) means for producing oil from the oil reservoir through the well bore of the injection-production well when the flow rate of water necessary to maintain the back-pressure below the oil reservoir fracture pressure drops below a predetermined level.

4,319,636

SURFACTANT WATERFLOOD OIL RECOVERY PROCESS

Mohan V. Kudchadker, Houston, and Lawrence E. Whittington, Katy, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 19, 1980, Ser. No. 122,219
Int. Cl.[3] E21B *43/22*
U.S. Cl. 166—274 13 Claims

1. In a method for recovering petroleum from a subterranean, permeable, saline water and petroleum-containing formation, said formation being penetrated by at least one injection well and by at least one spaced-apart production well, comprising injecting into the formation via the injection well a predetermined quantity of aqueous fluid containing at least two surfactants, one petroleum sulfonate primary anionic surfactant and one solubilizing co-surfactant selected from the group consisting of nonionic surfactants having the following formula:

$$R_aO(R_a'O)_{na}H$$

wherein R_a is a C_8 to C_{22} alkyl or an alkylaryl comprising benzene, toluene or xylene having attached thereto at least one C_6 to C_{18} alkyl group, R_a' is ethylene or a mixture of ethylene and higher molecular weight alkylene with relatively more ethylene than higher molecular weight alkylene, na is a number from 2 to 12, O is oxygen and H is hydrogen; ethoxylated and sulfonated surfactants having the following formula:

$$R_bO(R_b'O)_{nb}R_b''SO_3M_b$$

wherein R_b is a C_8 to C_{22} alkyl or an alkylaryl consisting of benzene, toluene or xylene having attached thereto at least one alkyl group containing from 6 to 18 carbon atoms, R_b' is ethylene or a mixture of ethylene and higher alkylene with relatively more ethylene than higher alkylene, nb is a number from 2 to 12, R_b'' is ethylene, propylene, hydroxypropylene or butylene, O is oxygen, S is sulfur and M_b is a monovalent cation selected from the group consisting of sodium, potassium, lithium and ammonium; ethoxylated and sulfated surfactants having the following formula:

$$R_cO(R_c'O)_{nc}SO_3M_c^+$$

wherein R_c is a C_8 to C_{22} alkyl or an alkylaryl consisting of

benzene, toluene or xylene having attached thereto at least one alkyl group containing from 6 to 18 carbon atoms, R_c' is ethylene or a mixture of ethylene and higher alkylene with relatively more ethylene than higher alkylene, nc is a number from 2 to 12, O is oxygen, S is sulfur and M_c is a monovalent cation selected from the group consisting of sodium, potassium, lithium and ammonium; and mixtures thereof,

said surfactant fluid displacing petroleum through the formation from which it is recovered to the surface of the earth via the production well, the improvement which comprises:

selecting and blending the petroleum sulfonate and solubilizing co-surfactant in the first portion of the surfactant-containing fluid so as to yield a fluid which reduces the interfacial tension between water and the formation petroleum to a value less than 2×10^{-2} dynes per centimeter, the ratio of solubilizing cosurfactant to petroleum sulfonate being such that the cosurfactant-petroleum sulfonate combination exhibits borderline solubility in the aqueous phase, and selecting and blending the petroleum sulfonate and solubilizing co-surfactant of the second portion of the aqueous surfactant fluid so as to produce a fluid exhibiting substantially greater viscosity than the viscosity of the first portion of the slug, the average equivalent weight of petroleum sulfonate used in the second portion of fluid being selected to produce maximum fluid viscosity and being different from the average equivalent weight of petroleum sulfonate used in the first portion, and the ratio of solubilizing co-surfactant to petroleum sulfonate in the second portion of surfactant fluid being selected to produce maximum fluid viscosity and being different from the ratio used in the first portion of surfactant fluid.

4,319,637

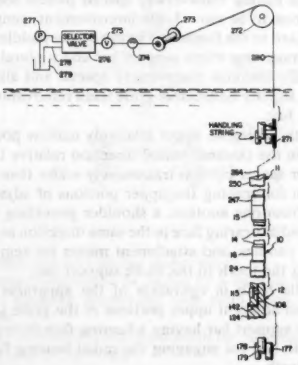
WELL TOOL ORIENTATION SYSTEM WITH REMOTE INDICATOR

Michael L. Wilson, Houston, Tex., assignor to Armco Inc., Middletown, Ohio

Continuation of Ser. No. 36,659, May 7, 1979, abandoned. This application Nov. 7, 1980, Ser. No. 204,938

Int. Cl.³ E21B *43/013, 17/00*

U.S. Cl. 166—340 **15 Claims**



1. In apparatus for remotely installing a well tool in a predetermined rotational position in an underwater well installation by operations carried out from an operational base at the surface of the body of water with the aid of a guidance system and a handling string, the combination of a handling tool comprising

a body connectable to the handling string,

a locator device mounted on the body for movement relative thereto between a retracted inactive position and an extended active position in which the locator device projects from the body,

yieldable means biasing the locator device to its active position, and

position detector means carried by the body and operatively associated with the locator device to respond to presence of the locator device in its active position and presence of the locator device in its inactive position; and

means responsive to the position detector means for providing at the operational base an observable indication of the position of the locator device.

4,319,638

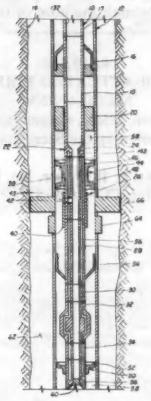
APPARATUS FOR CEMENTING FROM A FLOATING VESSEL

Eugene E. Baker, and Ernest E. Carter, Jr., both of Duncan, Okla., assignors to Halliburton Services, Duncan, Okla.

Division of Ser. No. 958,706, Nov. 8, 1978, Pat. No. 4,286,658. This application Aug. 4, 1980, Ser. No. 175,001

Int. Cl.³ E21B *34/12, 43/01*

U.S. Cl. 166—355 **8 Claims**



1. Apparatus for cementing an oil well borehole from a floating vessel, comprising:

a sliding sleeve cementing valve, adapted to be interconnected with a casing string; and

a drill string, including:

a drill pipe;

an opening positioner, connected to said drill pipe, for opening said cementing valve;

an anchor means, connected to said opening positioner, to provide sufficient resistance, between said drill string and said casing string, to operate a motion compensator on said floating vessel; and

an isolation packer, connected to said anchor means.

4,319,639

WELL SAFETY SYSTEM METHOD

James D. Mott, Houston, Tex., assignor to Hydril Company, Houston, Tex.

Division of Ser. No. 2,197, Jan. 9, 1979, Pat. No. 4,260,021. This application Dec. 12, 1979, Ser. No. 103,071

Int. Cl.³ E21B *23/00*

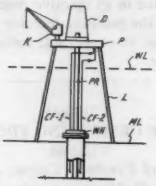
U.S. Cl. 166—377 **19 Claims**

1. A method of installing a subsurface tubing hanger in a well, including the steps of:

connecting the subsurface tubing hanger in the string of well tubing;

connecting a predetermined amount of well tubing above the subsurface tubing hanger;

setting the subsurface tubing hanger at the subsurface location for supporting the string of well tubing below the subsurface tubing hanger by increasing a controlled pressure in the bore of the well tubing communicated to the pressure setting mechanism of the subsurface tubing hanger;



isolating the pressure setting mechanism of the subsurface tubing hanger from the pressure in the bore of the well tubing; and

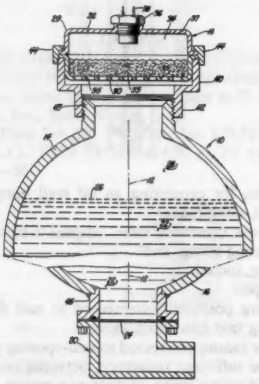
retrieving the plug catcher and plug from the subsurface tubing hanger through the bore of the well tubing.

4,319,640

GAS GENERATOR-ACTUATED FIRE SUPPRESSANT MECHANISM

Karl R. Brobeil, Warren, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 6, 1979, Ser. No. 101,327
Int. Cl.³ A62C *35/02*
U.S. Cl. 169—28 **1 Claim**



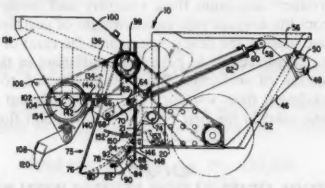
1. A fire-suppressant mechanism for disposition in a military vehicle to suppress near-explosive fires, comprising a container at least partially filled with vaporizable fire-suppressant liquid at normal liquid vapor pressure, said container including a cylindrical upright bottle having a vertical longitudinal axis; an L-shaped liquid discharge duct (**20**) connected to the lower end of the bottle for directing fire-suppressant liquid from the bottle laterally toward an emergent fireball; a frangible diaphragm interposed between the bottle lower end and discharge duct to normally prevent passage of liquid through the duct; said bottle having a neck (**43**) at its upper end defining a passage; a hollow tubular cup-shaped holder (**40**) having a depending annular section (**42**) screwed onto said neck in an area above the bottle; a gas-generating device bodily installable within the holder for generating at least fifty atmospheres gaseous pressure in the aforementioned passage and space above the fire-suppressant liquid, sufficient to rapidly expel the liquid through the aformentioned discharge duct; said gas-generating device comprising a cylindrical container (**29**) containing a mass of reactant particulates ignitable to produce a gaseous pressure by exothermic reaction, an electrical igniter (**36**) carried on the upper end wall of the cylindrical container for igniting the particulates, and openings in the lower end wall of the container for conducting gaseous pressure from the container downwardly into the neck area of the bottle; said container having means thereon for spacing its lower end wall from the opposed internal surface of the tubular holder whereby all of the openings in said lower end wall communicate with the above-mentioned passage defined by the neck area of the bottle; and an annular collar screwable onto an external surface of the tubular holder to exert a clamping force on the gas-generating device container; said collar being unscrewable from the holder to permit bodily removal of the gas-generating device from the holder.

4,319,641

ROCK PICKER

Wilfred J. Degelman, Regina, Canada, assignor to Degelman Industries Ltd., Regina, Canada

Filed Nov. 5, 1979, Ser. No. 91,094
Int. Cl.³ A01B *43/00*
U.S. Cl. 171—63 **22 Claims**



1. In a rotary rock picker for moving rocks and other objects, and provided with a frame, a rotatable reel rotatably mounted in the frame, a plurality of substantially identical paddles pivotally mounted on the reel and extending generally symmetrically radially outwardly therefrom, the pivotal axes being substantially parallel to the axis of rotation of the reel, each paddle having transversely spaced paddle teeth for engaging objects to be moved, the improvement comprising:

a grille fixed to the frame and swept by the paddles comprising a transverse tooth support bar and a plurality of substantially identical transversely spaced and aligned individual slightly deflectable grille teeth removably mounted on the bar;

each tooth having an upper relatively narrow portion elongated in the circumferential direction relative to the reel, a lower spacer portion transversely wider than the upper portion for spacing the upper portions of adjacent grille teeth from one another, a shoulder providing a substantially radial bearing face in the same direction as the sweep of the paddles, and attachment means for removably attaching the tooth to the tooth support bar;

the paddle teeth in operation of the apparatus sweeping between adjacent upper portions of the grille teeth;

the tooth support bar having a bearing face facing and mating with and for engaging the radial bearing faces of the grille teeth.

4,319,642

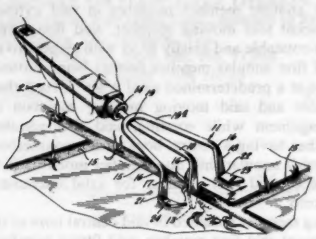
WEED AND GRASS REMOVING TOOL

William J. Merz, 220 W. Rittenhouse Sq., Philadelphia, Pa. 19103

Filed Jun. 6, 1980, Ser. No. 156,916
Int. Cl.³ A01B *1/16*
U.S. Cl. 172—13 **7 Claims**

1. A tool for removing weeds and debris from grooves

between paving stones, comprising a handle and a claw rigidly mounted thereto, said claw comprising three tines, in spaced apart side-by-side relationship, each of said tines having a shank and all of said shanks touching a common plane, all of said shanks further being bent downwardly from said plane in a direction substantially normal to said plane, the central one of said tines extending from said plane to a level at the tip thereof ensuring penetration of its tip to the intended maximum depth



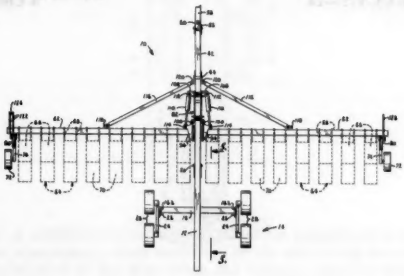
of cultivation, said tines right and left of said central tine being reversely bent away from said handle and also away from said downward direction at a locus intermediate the plane of the shanks and the level of the tip on said central tine, said tines right and left of said central tine being free of structure in said downward direction lower than the reversely bent portions thereof whereby the reversely bent portions of the right and left tines serve to limit penetration of the central tine into the grooves.

4,319,643

FRONT FOLDING AGRICULTURAL TOOL BAR WITH MOVABLE CARRIAGE TO WHICH WINGS COUPLED

Jackie L. Carter, Lucerne, and Jerry D. Carter, Unionville, both of Mo., assignors to Carmaco, Inc., Unionville, Mo.

Filed Mar. 3, 1980, Ser. No. 126,195
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—311 **14 Claims**



14. An agricultural tool bar comprising:

a main beam adapted to be pulled by a traction vehicle;

a wheel assembly supporting said main beam above the ground;

a carriage mounted to said main beam for movement thereon lengthwise of the beam;

a pair of tool supporting wing sections each having one end coupled with said carriage for pivotal movement between an extended position wherein the wing section extends laterally from said main beam and a folded transport position wherein the wing section is oriented generally parallel to and alongside the main beam;

a link for each wing section pivotally connected with said beam at one end and with the corresponding wing section at the opposite end in a manner to effect pivotal movement of the wing section toward the extended position in response to movement of said carriage toward said one end of the link and toward the transport position in response to movement of said carriage away from said one end of the link; and

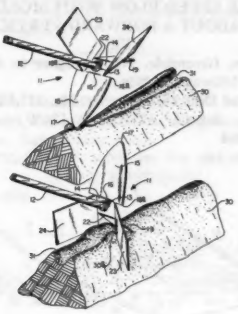
power means for effecting movement of said carriage along said main beam in opposite directions.

4,319,644

ROW OPENING AND ROW CLOSING TOOL

Leroy Young, 502 Main St., Franklinton, La. 70438

Filed Dec. 3, 1979, Ser. No. 99,475
Int. Cl.³ A01B *1/20*
U.S. Cl. 172—375 **3 Claims**



1. A hand-held garden implement adapted to dig a trench for a seed row and cover the trench having an elongated handle comprising:

a. a central plate portion to which said handle is affixed, said central plate portion having a forward side and a rearward side and being generally rectangular in shape with four edges, the forward and rearward sides further defining corresponding forward and rearward directions pointing away from the respective sides of the central plate;

b. a handle-receiving member centrally attached to the forward side of said central plate, said handle-receiving member being of cylindrical configuration, said handle being received in said handle-receiving member and projecting in the forward direction away from said central plate;

c. a tapered triangular digging blade for digging a trench for seeds in a row formed of dirt integral with said central plate and depending from one of said edges thereof, said one edge at the junction of the digging blade and central plate comprising a first bend line, said digging blade terminating in a point, and wherein said digging blade forms an angle of from about 75 degrees to about 100 degrees with the longitudinal axis of the handle, the tapered digging blade generally being flat from said first bend at the junction of said blade and said central plate to said point;

d. first and second rake blades projecting in the forward direction with respect to said central plate, said rake blades projecting from two additional ones of said edges of said central plate, which additional edges are opposite each other, said rake blades projecting from the flat central plate at a diverging angle bisected by said handle wherein the included angle between the diverging blades varies from about 50 to about 100 degrees, said first and second rake blades being so shaped and oriented with respect to each other that said rake blades are positioned to force dirt from the sides of said trench to fill said trench, said rake blades being of substantially rectangular configuration; and

e. a third rectangular rake blade smaller than said first and second blades for smoothing said dirt over said trench projecting from that one of said edges of the said central plate that is opposite to the edge to which said tapered

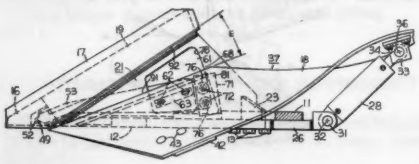
blade is attached, said that edge at the junction of the third rake blade and the central plate comprising a third bend line, the third rake blade being affixed to that edge of said flat central plate at the third bend line along which the third rake blade is bent in the rearward direction with respect to said central plate generally paralled to said handle, said third blade being so oriented and proportioned relative to said first and second blades as to act in conjunction therewith so that as said first and second blades force dirt from the sides of said trench to fill the same, said third blade is positioned to smooth said dirt over the trench.

4,319,645

VARIABLE SPEED PLOW WITH MOLDBOARD PIVOTING ABOUT A FORWARD VERTICAL PIVOT AXIS

David S. Totten, Greendale, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 15, 1980, Ser. No. 217,533
Int. Cl.³ A01B 3/12, 15/10
U.S. Cl. 172—664 **19 Claims**



1. A variable speed moldboard plow with a stub beam characterized by

a plow bottom having

a fixed portion rigidly connected to said stub beam, and including

a share extending laterally, upwardly and rearwardly from a forward tip terminating in an upper edge and a land side

a pivotable moldboard portion including a moldboard with a lower edge

pivot means pivotally connecting said moldboard portion to said fixed portion near said tip for horizontal swinging movement of said moldboard portion between a low speed position in which the lower edge of said moldboard is contiguous to the upper edge of said share and a high speed position in which said lower edge of said moldboard diverges rearwardly of said upper edge of said share, and

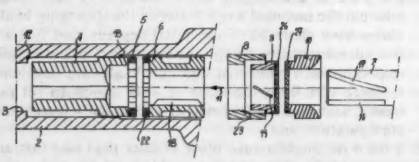
means operable to pivotally adjust said moldboard portion relative to said fixed portion.

4,319,646

ROTARY TOOL DRIVE SYSTEM FOR A JACK HAMMER

Henri Emonet, 12 rue R.P. Couturier, Montbrison, Loire, France

Filed Sep. 19, 1978, Ser. No. 943,722
Int. Cl.³ B25D 15/00
U.S. Cl. 173—111 **7 Claims**



1. A rotary drive system wherein a piston is operated by a compressed air distributor to strike a tool of a jack hammer, said rotary drive system comprising:

a housing having a cylindrical bore, said piston mounted at one end of said cylindrical bore;

a rotatable axially fixed tool holder member mounted in the other end of said cylindrical bore;

a moving member mounted in said cylindrical bore adjacent said tool holder member for driving engagement therewith;

a first annular member mounted in said cylindrical bore adjacent said moving member, said first member being non-rotatable and axially fixed with respect to said piston, said first annular member further being mounted in said bore at a predetermined axial position such that said tool holder and said moving member maintain continuous engagement while rotating, said first annular member further having a central bore with a counterbore therein;

a movable annular shift dog member mounted in the central bore of said first member for axial movement relative thereto;

a fitting member mounted in said central bore of the housing adjacent said first member, said fitting member having a stepped outer diameter with one end portion mounted in said central bore of the first annular member; and

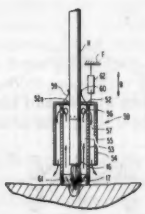
means for providing rotary driving motion to said tool holder member such that said rotary driving motion imparted to said tool holder causes said piston to strike the tool at the end of the forward stroke without rotating and whereby said piston causes said tool holder member to rotate by the action of the shift dog member during the reversing stroke of the piston.

4,319,647

FLAME DRILL CHANNELLING METHOD AND APPARATUS FOR REDUCING NOISE AND DUST LEVELS

James A. Browning, Hanover, N.H., assignor to Browning Engineering Corporation, Hanover, N.H.

Filed Apr. 16, 1980, Ser. No. 140,934
Int. Cl.³ E21B 7/14
U.S. Cl. 175—14 **4 Claims**



1. A method of flame drilling of a rock mass or the like with reduced noise and dust levels, said method including:

feeding of a flame drill burner downwardly, flame first into said rock mass at a rate producing a bore hole of given diameter,

muffling the immediate area of the flame impingement at the end of the flame drill facing said rock formation being drilled and at the bottom of the bore hole during its creation by confining the area of flame impingement within a cylindrical member borne by the flame drill at its lower end including a seal at an end of the concentric muffler tube projecting beyond the end of the flame drill and in contact with the bottom of the bore hole, and

spraying a liquid into the bore hole, exteriorly of the drill burner within said cylindrical muffler tube from a point immediately above the flame impingement area to create, as a result of the high temperature operation of the flame

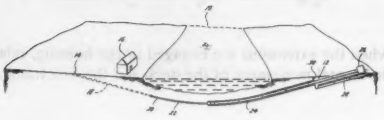
drill, steam to substantially reduce free particles of dust created during the drilling process; thereby reducing both the noise generated during flame drilling and the dust created thereby to acceptable levels.

4,319,648

PROCESS FOR DRILLING UNDERGROUND ARCUATE PATHS AND INSTALLING PRODUCTION CASINGS, CONDUITS, OR FLOW PIPES THEREIN

Martin O. Cherrington, Fair Oaks, Calif., assignor to Reading & Bates Construction Co., Houston, Tex.

Filed Sep. 24, 1979, Ser. No. 77,960
Int. Cl.³ E21B 7/06, 10/26
U.S. Cl. 175—53 **57 Claims**



1. A method for placing a casing along an underground inverted arcuate path comprising:

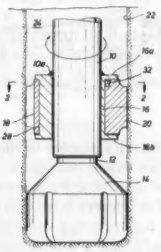
drawing reaming apparatus together with said casing in a following relationship to said reaming apparatus along an underground inverted arcuate path, without any substantial rotation of said casing.

4,319,649

STABILIZER

John D. Jeter, P.O. Box 5236, Midland, Tex. 79701

Filed Jun. 18, 1973, Ser. No. 370,927
Int. Cl.³ E21B 7/08
U.S. Cl. 175—73 **28 Claims**



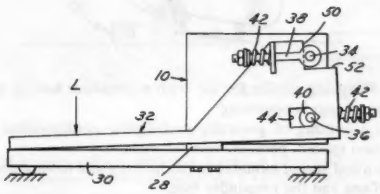
1. A stabilizer for use with a drill string assembly in a well bore comprising a body supported by the drill string for rotation relative to the drill string and having a portion that is eccentric to the longitudinal axis of the drill string and a sleeve for engaging the walls of the well bore mounted for rotation on the body around an axis eccentric to the longitudinal axis of the body and means for limiting the relative rotation of the sleeve and the body between first and second positions in which the sleeve is eccentric of the longitudinal axis of the drill string in at least one of said positions, said body portion being eccentric of the longitudinal axis of the drill string the same amount as the axis of rotation of the sleeve is eccentric of the longitudinal axis of the body whereby the sleeve can be rotated relative to the body between said first position where the eccentricities of the body and the sleeve cancel and the longitudinal axis of the sleeve coincides with the longitudinal axis of the drill string and said second position where the eccentricities are cumulative to position the longitudinal axis of the sleeve the maximum distant from the longitudinal axis of the drill string, releasable means for holding the body and sleeve in one of said positions, said releasable holding means including latch means movable between a first position to stop the relative rotation of the body and sleeve when the sleeve and body are in said first position and a second position to stop the relative rotation of the body and sleeve when they are in said second position to exert a lateral force on the drill string, means to orient the stabilizer when in said second position to exert said lateral force in the desired direction, said orienting means including a weight, means mounting the weight for rotation around an axis parallel to the longitudinal axis of the drill string with its center of gravity offset from the axis of rotation so the weight will rotate to the low side of the drill string, means for connecting the sleeve and body to the drill string for rotation with the drill string and to release the sleeve and body when they are in the desired position relative to the weight to orient the stabilizer relative to the low side of the drill string to exert a lateral force in the desired direction.

4,319,650

LOAD CELL SCALE

Albert E. Brendel, Lake Orion, Mich., assignor to Sensor Developments, Inc., Lake Orion, Mich.

Filed Sep. 5, 1980, Ser. No. 184,449
Int. Cl.³ G01G 23/02
U.S. Cl. 177—156 **4 Claims**



1. In a weighing system of the type utilizing a strain gauge load cell whose height is greater than the elevation of a weighing platform means to which it is connected, the load cell having a fixed first portion which is rigidly mounted to a fixed underlying base and the load cell further having a second portion connected to the first portion by resilient members which permit the second portion to resiliently yield in the vertical direction in response to vertical forces applied thereto by the weighing platform means, the second portion being essentially unyieldable in all other directions, an improved means for interconnecting the platform means and load cell and for protecting the load cell against overloads comprising:

the platform means having a load-receiving portion extending laterally from the load cell at an elevation which is below the upper portion of the load cell, said load-receiving portion being normally spaced above the fixed base;

said platform means further having upper and lower vertically spaced load cell-engaging portions for normally supporting said platform means solely from the load cell and transmitting all loads less than a predetermined magnitude to the load cell;

one of said upper and lower load cell-engaging portions comprising first abutment surface means which are resiliently biased in a horizontal direction into engagement with the second portion of the load cell, said one load cell-engaging portion being incapable of transmitting any vertical force components to the load cell;

the other of said upper and lower load cell-engaging portions comprising second abutment surface means which are resiliently biased in a horizontal direction into engagement with the second portion of the load cell, said horizontal resilient bias being in a direction opposite to the resilient bias of said first abutment surface means, and said second abutment surface means being capable of transmit-

ting both horizontal and vertical force components to the second portion of the load cell;

vertical loads in excess of said predetermined magnitude creating horizontal forces at said upper and lower load cell-engaging portions which exceed the pre-load force of said resilient biasing forces, causing said first and second abutment surfaces to disengage from the load cell, and said platform means to bottom out against the fixed base.

4,319,651

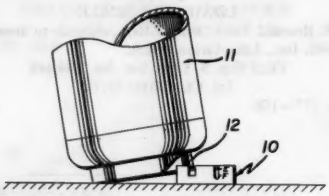
WEIGHING DEVICE

Kenneth Robichaud, P.O. Box 1626, Lunenburg, Mass. 01462

Filed Apr. 28, 1980, Ser. No. 143,759

Int. Cl.³ G01G *3/08*

U.S. Cl. 177—229 **4 Claims**



1. Weighing device for use with a container having a supporting flange, comprising:

(a) a housing of generally rectangular configuration with two spaced, parallel, vertical walls,

(b) a leaf spring mounted in the housing and having one end fixed and the remainder free,

(c) a first slot formed in the housing exposing an intermediate portion of the spring and adapted to receive the supporting flange of the container,

(d) a second slot formed in the housing spaced from the first slot exposing an end portion of the spring, the first slot extending downwardly from the top edges of both walls, the second slot extending downwardly from the top edge of one of the vertical walls in spaced parallel relationship to the first slot,

(e) indicia being provided on the outer surface of the wall having the second slot, the indicia showing an EMPTY and FULL condition of the container, and

(f) a shaft extending between the said walls of the housing at a location remote from both slots, the leaf spring being wrapped around the shaft and having another free end that extends vertically and is locked in an aperture in the housing, the said end portion of the spring exposed in the second slot lying adjacent the said indicia to show a condition at or between FULL and EMPTY.

4,319,652

WEIGH SCALE

Joseph R. Guertin, 4651 Vanguard Rd., Richmond, British Columbia, Canada (V6X 2P7)

Filed Aug. 11, 1980, Ser. No. 176,916

Int. Cl.³ G01G *21/12, 23/02*

U.S. Cl. 177—255 **8 Claims**

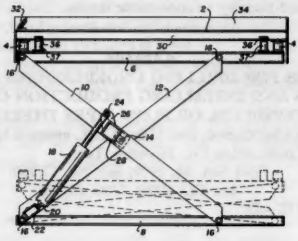
1. A weigh scale comprising a load receiving deck;

load cells to support the deck during weighing;

a first frame, below the load receiving deck, and carrying the load cells;

a plurality of vertical housings formed on one of said deck and said first frame;

a retractable extension on the other of said deck and said first frame, positioned to extend into each housing to prevent,



when the extensions are engaged in the housing, relative horizontal movement of the deck and the first frame.

4,319,653

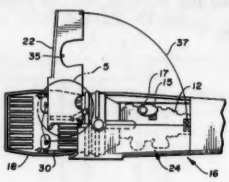
ENGINE ENCLOSURE FOR TRACTOR

Richard B. Carlson, 3519 S. 10th St., Fargo, N. Dak. 58103

Filed Mar. 24, 1980, Ser. No. 133,401

Int. Cl.³ B62D *25/10*

U.S. Cl. 180—89.17 **7 Claims**



1. In combination with a tractor having an engine mounted on a chassis frame, an engine enclosure comprising:

an outwardly and downwardly pivoting front grille pivotally connected at a lower front end of the chassis frame;

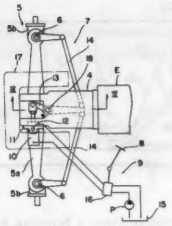
a first enclosure half pivoting outwardly and horizontally from the engine along a first substantially vertical pivot axis proximate a centerplane of the tractor and behind the grill and having a substantially vertical side section and a substantially horizontal dependent top section overlying approximately half the engine, said first enclosure half being pivotally attached at the front end of the chassis frame proximate one side of the longitudinal tractor center plane; and

a second enclosure half pivoting outwardly and horizontally from the engine along a second substantially vertical pivot axis proximate the center plane of the tractor and also behind the grill and having a second substantially vertical side section and a second substantially horizontal dependent top section overlying the other half of the engine, said second enclosure half being pivotally attached at the front end of the chassis frame proximate an opposing side to the first enclosure half of the longitudinal tractor center whereby when the front grille is pivoted outwardly and downwardly, either of the enclosure halves may be pivoted outwardly and horizontally to a stable outwardly pivoted position, providing optimal access to the side of the engine covered by the enclosure half.

4,319,654
TRACTOR STEERING MECHANISM

Tuginobu Ujita, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Mar. 24, 1980, Ser. No. 133,226
Claims priority, application Japan, Jun. 7, 1979, 54-71527
Int. Cl.³ B62D 5/06
U.S. Cl. 180—155 4 Claims

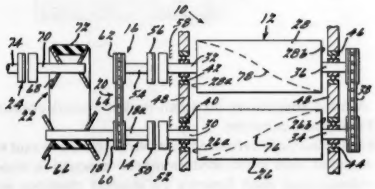


1. A tractor steering mechanism, comprising
(A) a frame in the shape of a box, secured to and extending forwardly from an engine,
(B) a front axle case supported by said frame (A), which houses a pair of axles,
(C) a pair of wheels, each wheel connected to a respective axle of said pair of axles (B),
(D) a pair of tie rods, each tie rod engaged with a respective wheel of said pair of wheels (C) for steering said pair of wheels,
(E) swing means having one end thereof pivotally connected to said tie rods (D), said swing means disposed within said frame (A) and oscillatingly attached to said frame (A) through a vertical axis, and
(F) a hydraulic cylinder having a cylinder rod pivotally connected to the end of said swing means (E) opposite said tie rods (D), said hydraulic cylinder oscillatingly attached to said frame (A) through an additional vertical axis and having a rod projecting end thereof disposed within said frame (A).

4,319,655
REGENERATIVE BRAKING DEVICE WITH ROTATIONALLY MOUNTED ENERGY STORAGE MEANS

Lyle O. Hoppie, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 12, 1979, Ser. No. 102,696
Int. Cl.³ B60K 25/00
U.S. Cl. 180—165 3 Claims

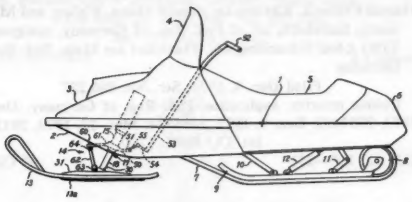


1. A regenerative braking device for accumulating energy from a vehicle drivetrain to brake the vehicle and for delivering the accumulated energy to the drivetrain to accelerate the vehicle, said device comprising:
input and output driveshafts;
means mounting said shafts for rotation;
an input clutch and an output clutch respectively operative when applied to drivingly connect said input shaft and said output shaft with the drivetrain;
an input brake and an output brake respectively operative when applied to prevent rotation of said input and output driveshafts; and
elastomeric roller means having an input end fixed to said input shaft and an output end fixed to said output shaft for rotationally supporting said roller means, said roller means torsionally stressed to accumulate energy from the drivetrain when said input clutch and output brake are applied, and said roller means torsionally relaxed to deliver accumulated energy to the drivetain when said output clutch and input brake are applied.

4,319,656
STEERING MECHANISM FOR SNOW VEHICLES

Takashi Kobayashi, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 8, 1980, Ser. No. 119,652
Int. Cl.³ B62B 17/04; B62M 27/02
U.S. Cl. 180—182 7 Claims

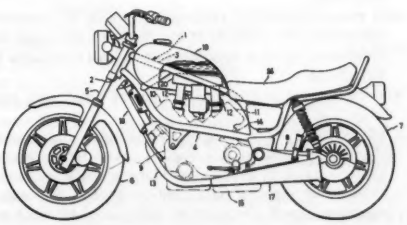


1. In a snow vehicle having a chassis, a biased-downwardly extending support member including a plunger member capable of extension and retraction along a steering axis, and a steering ski, said support member mounting said steering ski to said chassis, the improvement comprising: bearing means interposed between said ski and said plunger rotatably mounting said steering ski to said support member for steering rotation around said steering axis, without restraint against rotation around said steering axis, and means for turning said steering ski around said steering axis.

4,319,657
AIR INTAKE CONDUITRY FOR A MOTORCYCLE

Kazuhiko Nomura, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 25, 1979, Ser. No. 78,696
Claims priority, application Japan, Sep. 25, 1978, 53-116695
Int. Cl.³ F02M 35/16, 35/12
U.S. Cl. 180—219 4 Claims



1. In combination:
a motorcycle frame;
a multi-bank, multi-cylinder V-type engine supported by said frame;
a fuel tank supported by said frame, said fuel tank being

disposed above said engine and being generally V-shaped, with legs depending downwardly at each side; and

air intake conduitry comprising a respective air intake pipe extending upwardly from each bank of said engine, a connecting pipe extending substantially vertically adjacent to and between said intake pipes, and a connecting box disposed immediately beneath said fuel tank between said legs thereof, the upper ends of said air intake pipes also being disposed between said legs of said fuel tank, said connecting box interconnecting said upper ends of said intake pipes and said connecting pipe.

4,319,658

DEVICE FOR THE CONTROL OF THE TRAVELING SPEED OF A MOTOR VEHICLE

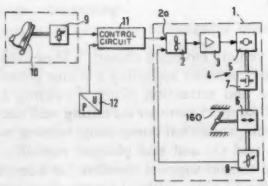
Harald Collonia, Königstein; Arnold Mann, Bieber, and Martin Haub, Steinbach, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,297

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1977, 2754439; Dec. 9, 1977, 2754824; Mar. 17, 1978, 2811633

Int. Cl.[3] B60L *3/00*

U.S. Cl. 180—271 19 Claims



1. In a device for the control of the traveling speed of a motor vehicle with a gas pedal actuatable by the vehicle driver, the gas pedal producing an electrical signal emitted to the desired value input of an electrical controller, the output signal of which acts on a positioning actuator, the latter being coupled with an element, particularly the throttle valve of the engine of the vehicle, which influences the fuel-air mixture, the instantaneous setting position of the positioning actuator being transmitted as an electric signal to the actual value input of the electrical controller, the improvement comprising

circuit means for driving one of the inputs of the electrical controller,

said circuit means for producing a signal for operatively influencing the position of the throttle valve, said latter-mentioned signal is dependent on at least one factor to be monitored,

said circuit means contains, a control stage, said control stage has

a desired value input, an actual value input, and an output,

said output of said control stage is connected with the desired value input of the electrical controller and said desired value input of said control stage is fed with the electrical signal produced by said gas pedal, said actual value input of said control stage is applied with said signal which is dependent on the at least one factor to be monitored, and

switches means for switching on and switching off, respectively, said circuit means, said switch means is actuatable by complete pivoting of said gas pedal.

4,319,659

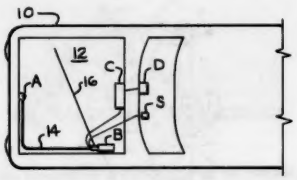
COMPARTMENT LOCKING MEANS AND THERMAL ACTUATOR THEREFOR

Heckelman, James D., RR #2 Wikel Rd., Huron, Ohio 44839, and William P. Hickey, 908 Spitzer Bldg., Toledo, Ohio 43604

Filed Feb. 4, 1980, Ser. No. 117,832

Int. Cl.[3] B60R *25/00;* E05F *15/20*

U.S. Cl. 180—271 22 Claims



1. An actuator comprising: a housing having a hermetically sealed chamber therein; a movable wall in said chamber; an electrical heating element in said hermetically sealed chamber with input and output terminals extending externally of said housing; an expansible fluid inside said hermetically sealed chamber to be heated by said electrical heating element; and means storing energy convertible to heat on the outside of said housing arranged so that when triggered heat therefrom will be transferred through said housing to expand said fluid and actuate said movable wall independently of actuation by said electrical heating element.

4,319,660

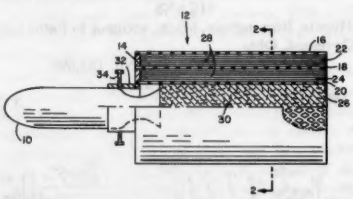
MECHANICAL NOISE SUPPRESSOR FOR SMALL ROCKET MOTORS

Charles R. Bishop, Arab, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 2, 1980, Ser. No. 183,604

Int. Cl.[3] F01N *1/24*

U.S. Cl. 181—222 4 Claims



1. A noise suppressor for small rocket motors comprising:

(a) a support member;

(b) a plurality of perforated members secured to said support member, said perforated members disposed in concentric relation and each forming an annular chamber with the adjacent perforated member, and the center said perforated member enclosing a central chamber;

(c) noise suppression means carried in each said chamber, said noise suppression means in said central chamber being packed therein and disposed for being expelled from said chamber responsive to ignition of said rocket motor; and,

(d) means carried on said support member for aligning said noise suppressor to said rocket motor.

4,319,661

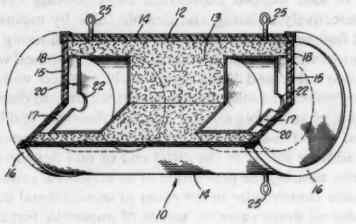
ACOUSTIC SPACE ABSORBER UNIT

Don A. Proudfoot, Greenwich, Conn., assignor to The Proudfoot Company, Inc., Greenwich, Conn.

Continuation of Ser. No. 944,146, Sep. 20, 1978, abandoned. This application Feb. 4, 1980, Ser. No. 117,997

Int. Cl.³ E04B *1/82*

U.S. Cl. 181—295 16 Claims



1. An acoustic space absorber comprising in combination:
an elongated cylindrical body of sound absorbing material;
a Helmholtz resonator within said body adjacent to one end thereof comprising a wall member of stiff substantially impermeable material forming a cavity and having orifice means having an isolated orifice structure in said wall member, said orifice means establishing acoustic communication between said cavity and the space external to said body, said isolated orifice structure being surrounded by a substantial portion of said impermeable wall member, said portion of said wall member having an outwardly facing area many times in excess of the cross-sectional area of said orifice structure, whereby acoustic waves external to said body force air into and from said cavity substantially entirely through said orifice structure;
and a second such Helmholtz resonator within said body adjacent to the opposite end thereof.

4,319,662

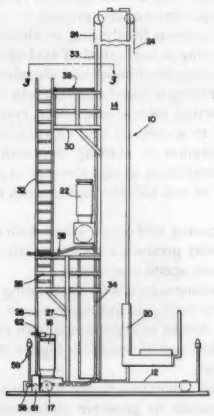
FIRE FIGHTING APPARATUS FOR A STORAGE/RETRIEVAL MACHINE

Novell D. Liston, Bountiful, Utah, assignor to Eaton Corporation, Cleveland, Ohio

Filed May 30, 1980, Ser. No. 154,694

Int. Cl.³ E06C *5/32*

U.S. Cl. 182—13 6 Claims



1. In a storage/retrieval machine comprising a base, a mast upstanding from said base, a floor-engaged drive wheel rotatably mounted on said base, and a first drive motor operatively connected to said drive wheel; a plurality of horizontal platforms mounted on said mast and spaced apart therealong, a first ladder extending from said base to a first of said platforms, one or more second ladders extending between platforms, a standpipe extending along said mast, a fire hose and nozzle assembly received at each of said platforms, valve means accessible from each of said platforms and connecting said fire hose and nozzle assemblies to said standpipe, means connecting said first drive motor to a central source of electrical power, an auxiliary drive motor mounted on said base, auxiliary electric power supply means independent of said centraL source and selectively engageable with said storage/retrieval machine for movement therewith along said floor, means connecting said auxiliary drive motor to said auxiliary power supply means, and means on said base for selectively engaging and disengaging said auxiliary drive motor with said drive wheel.

4,319,663

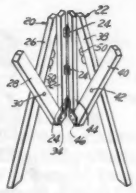
PORTABLE SAWHORSE

Dan E. Barden, 161 S. Jefferson, Otisville, Mich. 48463

Filed May 22, 1980, Ser. No. 152,331

Int. Cl.³ B27B *21/02*

U.S. Cl. 182—154 8 Claims



1. A foldable sawhorse including a pair of side portions, means for pivotally joining the two side portions along their respective vertical edges for folding;
said side members comprising in each case a flat planar member and a plurality of edge portions for bracing it;
said edge portions proximate the upper part of the side portions defining like V-shaped configurations for holding a log for a sawing operation;
said last-mentioned edge portions further including three reinforcing edge portions joined in a closed triangular relationship one to the other.

4,319,664

REMOTELY CONTROLLED OIL DRAIN VALVE

Ralph J. Price, 7636 Upper Miamisburg Rd., Miamisburg, Ohio 45342, and Jack Albert, 3608 Hertland Dr., Kettering, Ohio 45439

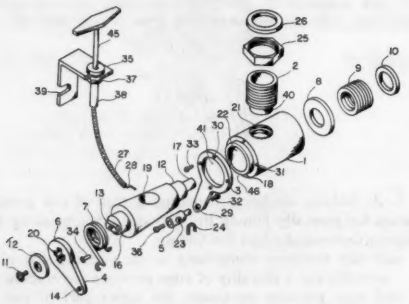
Filed Mar. 3, 1980, Ser. No. 126,426

Int. Cl.³ F01M *11/04;* F16K *31/46*

U.S. Cl. 184—1.5 2 Claims

1. A Remotely Controlled Oil Drain Valve device for permanent installation on any automotive crankcase, said device comprising a threaded tubular nipple with a structurally-provided lesser diametrical cylinder and functionally being threadedly receivable in the threaded opening located in the bottom of any said automotive crankcase and thereby being secured in position selectively by means of a fiber gasket and a gland nut, said lesser diametrical cylinder being permanently insertably mounted and affixed within a stepped dual diametrical opening of a cylindrical valve body by means of braized welding, said cylindrical valve body being comprised of a cylindrical body having a stepped dual diametrical opening extending radially through said cylindrical valve body, a tubular shoulder extending from one end of said cylindrical valve body thereof, a cylindrical tapered opening piercing said cylindrical valve

body therein, two threaded openings for the purpose of facilitating the securing of a cable bracket yoke around said tubular shoulder and to said cylindrical valve body by means of threaded fasteners, said cylindrical tapered opening providing for insertion of a cylindrical tapered valve core, said cylindrical tapered valve core being comprised of a conical shaped body having a diametrical opening for purpose of alignment into registry with said threaded tubular nipple opening and diametrical valve body opening of said cylindrical valve body by means of rotation of said cylindrical tapered valve core thereby communicating the interior of said automotive crankcase with the exterior environment of said cylindrical tapered valve core being further comprised of a tenon-ended cylindrical arm extending from the large end of said cylindrical tapered valve core and being secured within said cylindrical tapered opening provided in said cylindrical valve body by means of a retention washer, a tang-ended cylindrical arm extending from the smaller end of said cylindrical tapered valve core thereof, said retention washer mounted on said tenon-ended cylindrical arm of said cylindrical tapered valve core and in effect being pressed against the shoulder end of said cylindrical valve body by a partially compressed compression spring, said compression spring mounted on said tang-ended cylindrical arm of said cylindrical tapered valve core and compressedly affixed between said retention washer and said retention spring by means of mechanical conversion of the greater portion of the tang of the tang-ended cylindrical arm



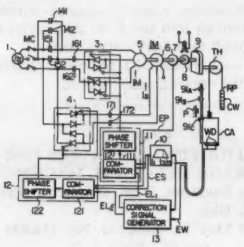
into a crown rivet head thereof, said tenon-ended cylindrical arm of said cylindrical tapered valve core, a tenon with a threaded diametrical opening for the securing of a cable control arm over the tenon end of said tenon-ended arm by means of a threaded fastener and disk-shaped washer, said cable control arm having a disk-shaped body with an extended arm and two elongated slotted openings being centrally located on the disk section of said cable control arm and being positioned at a 45° angle to both the extended arm and the diametrical opening of said cable control arm which structurally incorporates said disk-shaped body which being threadedly secured to said tenon-ended cylindrical arm thereby provides a retaining shoulder thus retaining a return spring upon said tenon-ended cylindrical arm and further retaining said return spring between said cable control arm and the shoulder of said cylindrical tapered valve core, said return spring comprised of a coil spring having a hook-ended arm extending from each end of said return spring thereof for the utilizing of the hooked end of one arm of said return spring for purpose of cradling the lower edge of the extended arm of said cable control arm and for the securing of the other hooked end of said return spring to the cable bracket yoke by means of a threaded fastener, said threaded fastener piercing a diametrical opening of said cable bracket yoke, said cable bracket yoke circumscribing said tubular shoulder of said cylindrical valve body and comprising a disk-shaped body having four diametrical openings circumscribing a diametrical bore opening and further comprising an extended arm having a diametrical opening wherein a stepped diametrical cable locking cylinder is affixed by means of a threaded fastener, said stepped diametrical cable locking cylinder rotatably affixed to and secured within said diametrical opening of the extended arm of said cable bracket yoke by means of a threaded fastener threadedly receivable in a threaded diametrical opening of said stepped diametrical cable locking cylinder for the securing positionally of a flexible cable by means of a threaded fastener when said flexible cable is insertably mounted within the radially positioned diametrical opening of said stepped diametrical cable locking cylinder therein selectively securing said flexible cable by means of a threaded fastener, said flexible cable providing a housing for a cable control wire, said cable control wire being housed within said flexible cable and being structurally equiped with one unhoused hooked end insertably mounted within said diametrical opening of said cable control arm and the other end being connected to a T-handled plunger, a U-shaped clip being affixed by slidable means to the distal end of said flexible cable and thereby assuring the prevention of an accidental retraction of said cable control wire in the event of an accidental activation of said oil drain valve by means of impactive forces exerted upon said flexible cable.

4,319,665

AC ELEVATOR CONTROL SYSTEM

Katsu Komuro, Mito; Sadao Hokari, and Yasuyuki Maeda, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 6, 1980, Ser. No. 147,046
Claims priority, application Japan, May 11, 1979, 54-57067
Int. Cl.³ B66B *1/28*
U.S. Cl. 187—29 R **14 Claims**



1. A control system for an AC elevator system driven from an AC power supply source, comprising:

induction motor means for driving an elevator;

means for detecting actual speed of said elevator;

means for detecting position of said elevator;

means for producing a speed command in response to said position detecting means, said speed command being so composed as to accelerate said elevator with a predetermined acceleration in starting operation and decrease gradually deceleration of said elevator in a stopping operation thereof as said elevator approaches to a target landing position;

means for comparing said actual speed with said speed command to thereby produce a speed deviation of said actual speed from said speed command;

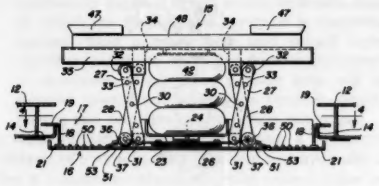
braking torque control means for responding to said comparing means to actuate said induction motor means to generate a braking torque in accordance with said speed deviation when said actual speed is higher than said speed command; and

additional torque generating means for actuating said induction motor means to generate additionally a torque in dependence on a load of said elevator in a region in the vicinity of said target landing position.

4,319,666
VEHICLE SERVICE JACK

Lee Hunter, 13501 Ladue Rd., Creve Coeur, Mo. 63141

Filed Oct. 29, 1979, Ser. No. 89,163
Int. Cl.[3] B66B *1/00*
U.S. Cl. 187—43 5 Claims

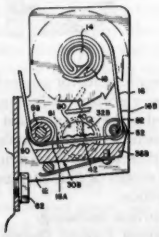


1. In a vehicle service rack having spaced apart vehicle wheel supporting runways for supporting the vehicle above a service floor, the improvement in the service rack of a vehicle lifting jack assembly carried by the service rack comprising: a carrier spanning the space between the runways and operatively supported thereon for movement along the service rack; vehicle lifting means parallel with and overlying said carrier; duplicate linkage means operatively extending from said carrier to said lifting means at positions spaced inwardly from each end of said lifting means and carrier, said linkage means acting to stabilize and maintain said lifting means substantially parallel with said carrier; elevating means operatively positioned on said carrier and beneath said lifting means for raising and lowering said lifting means relative to said carrier; coordinating means connected between said duplicate linkage means for effecting simultaneous operation of said linkage means in response to said elevating means raising and lowering said lifting means; and safety means operatively associated with said duplicate linkage means, said safety means including first means automatically operable upon raising of said lifting means to prevent lowering of said lifting means, and second means manually operable to disable said first automatically operable means for permitting the lowering of said lifting means.

4,319,667
LOCKING DEVICE FOR SEATBELT SYSTEMS

Masanao Motonami; Jun Yasumatsu, both of Toyota, and Yoshio Tsujiuchi, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, both of Aichi, Japan

Continuation-in-part of Ser. No. 874, Jan. 4, 1979, Pat. No. 4,234,185. This application Jul. 15, 1980, Ser. No. 169,177
Claims priority, application Japan, Mar. 28, 1978, 53-40618
Int. Cl.[3] A62B *35/02*
U.S. Cl. 188—65.1 6 Claims

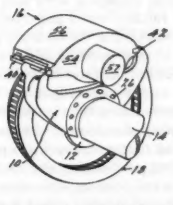


1. A locking device for a seatbelt system comprising:
a frame;
a rotatable base having a wavy surface supported on said frame;
a locking part supported on said frame and having an arm provided with a wavy surface adjacent to said rotatable base which under ordinary conditions is separated from the rotatable base so that a passenger-restraining seatbelt is allowed to pass freely between the locking part and the rotatable base, said wavy surfaces of said rotatable base and of said arm cooperating such that when said wavy surfaces approach each other, the seatbelt passing between said wavy surfaces is formed into a wavy shape to thereby clamp the seatbelt between said locking part and the rotatable base, said arm contacting the seatbelt to cause the locking part to approach the rotatable base when the tension on the seatbelt exceeds a given value;
means for resiliently securing the rotatable base at a predetermined position where the passenger restraining seatbelt is allowed to pass freely between the locking part and the rotatable base; and
a coupling device which will allow the arm to rotate about a minor axis which is transverse to the length of the seatbelt whereby the locking part is caused to press the seatbelt against the rotatable base across the entire width of said seatbelt.

4,319,668
PUSH-PULL CALIPER

Roger R. Johnson, Union Lake; Charles W. Kleinhagen, Jr., Livonia; Richard F. Neuman, Farmington, and Peter S. Winckler, Birmingham, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 26, 1979, Ser. No. 106,617
Int. Cl.[3] F16D *55/224*
U.S. Cl. 188—72.4 7 Claims



5. In a vehicular disc brake of the type including a rotor defining a pair of spaced annular braking surfaces, a torque plate having a mounting portion adapted to be fixedly secured to the axle assembly of the associated vehicle and further having two spaced arm portions, rail means rigid with each of said arm portions and extending generally parallel to the axis of the vehicle axle assembly, a caliper mounted and its opposite ends for sliding movement on the rail means, and a pair of brake pad assemblies associated with the caliper and mounted on opposite sides of the rotor; the improvement wherein:
A. each of said pad assemblies includes a backing plate and a brake pad carried by the backing plate;
B. the backing plate of one of said pad assemblies engages with rail means and is arranged to pull on one of said rail means in response to braking of said rotor with the latter rotating in a given direction; and
C. the backing plate of the other pad assembly is carried by the caliper and the caliper is arranged to push against the other of said rail means in response to braking of said rotor with the latter rotating in said given direction.

4,319,669

DISC BRAKE DEVICE

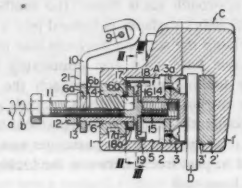
Mamoru Watanabe, Tokyo, Japan, assignor to Watanabe Engineering Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1980, Ser. No. 149,928

Claims priority, application Japan, May 18, 1979, 54-61747; May 31, 1979, 54-67923

Int. Cl.³ F16D *65/56, 55/08*

U.S. Cl. 188—72.8 **1 Claim**



1. A disc brake device comprising: a male screw member of a relatively large screw lead equipped at its outer end with a brake operating lever fixed thereto, and screw-engaged with a caliper arm of a brake caliper supporting a movable friction pad; an automatic gap adjustment device interposed between said male screw member and said movable friction pad for providing said movable friction pad with an advance feed for every reciprocating rotation of said male screw member; a manual adjustment bolt screw-engaged through the center of said male screw member and capable of adjusting the position of backward movement of said movable friction pad via said automatic gap adjustment device; said automatic gap adjustment device being defined by a non-rotatable pressure-bearing member interconnected to said movable friction pad; an adjustment screw of a relatively small screw lead having its one end screw-engaged with said pressure-bearing member and the other coming into contact with said manual adjustment bolt; a ratchet wheel secured to said adjustment screw; a driving member fitted to said male screw member rotatably therewith and having a flat driving surface on the outer circumference thereof, a feed pawl interconnected to said driving member via a resilient escape arm engaging with said driving surface for engaging with said ratchet wheel and transmitting the rotation of said male screw member in the forward rotating direction to said ratchet wheel so as to provide said pressure-bearing member with advance feed at the time of braking; and a return stop pawl anchored to said brake caliper for engaging with said ratchet wheel and preventing the rotation of said ratchet wheel in the reverse rotating direction at the time of brake-release; wherein when a load torque exceeding a predetermined value is applied to said feed pawl during the rotation of said driving member in the forward rotating direction, the feed action of said feed pawl upon said ratchet wheel is stopped by means of deflection of said resilient escape arm.

4,319,670

MECHANISM FOR PREVENTING DROPPING OF THE CALIPER DURING WORK ON A PIN-SLIDE TYPE DISC BRAKE

Hiroyuki Oka; Shingo Watanabe, both of Toyota; Yusyo Watanabe, and Masayuki Kurata, both of Kuki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi and Akebono Brake Industry Company Limited, Tokyo, both of, Japan

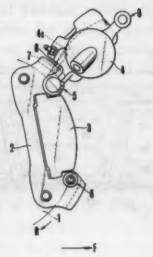
Filed Mar. 5, 1980, Ser. No. 127,329

Claims priority, application Japan, Mar. 13, 1979, 54-32212[U]

Int. Cl.³ F16D *65/02*

U.S. Cl. 188—73.34 **5 Claims**

1. In a pin-slide type disc brake having a caliper which straddles a portion of the periphery of a disc and is arranged to push friction pads against the disc by sliding in a direction parallel with the axis of the disc, and a support arranged to slidably carry said caliper through a pair of slide pins one of which is removable to permit said caliper to be turned about the other slide pin, the improvement of a caliper tumbling preventing structural arrangement comprising:



that said support is provided with a fitting hole formed therein in the radial direction of said disc; and a rod fitted into the fitting hole to have said caliper come to engage therewith when said caliper is turned about said other slide pin so that the caliper can be prevented from toppling over by further turning on said slide pin.

4,319,671

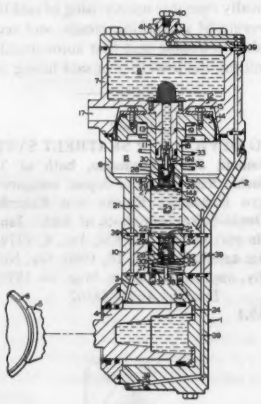
HYDRO-PNEUMATIC BRAKE ACTUATOR ARRANGED TO MAINTAIN A CONSTANT BRAKE SHOE CLEARANCE

Eric G. Smith, Burlington, and David A. Porteous, Grimsby, both of Canada, assignors to WABCO, Ltd., Hamilton, Canada

Filed Jun. 2, 1980, Ser. No. 155,343

Int. Cl.³ F16D *65/72*

U.S. Cl. 188—196 A **10 Claims**



1. A hydro-pneumatic actuator comprising:

(a) a power actuator portion including:

(i) a bore formed in the casing of said actuator portion; and

(ii) a power piston coaxially disposed in said bore and cooperating therewith to form a first hydraulic chamber to which the supply of fluid pressure effects actuation of said power piston;

(b) a converter portion including:

(i) a casing having formed therein a second hydraulic chamber connected to said first hydraulic chamber, a reservoir in which hydraulic fluid is stored, and a pneumatic control chamber;

(ii) a control piston operatively disposed in said control chamber for actuation from a release position to an application position in response to the supply of pneumatic pressure thereto;

(iii) a spring acting on said control piston to urge movement thereof toward said release position;

(iv) an input piston integral with said control piston and operatively disposed in said second hydraulic chamber, to which the fluid in said reservoir is connected, to transmit fluid pressure from said second hydraulic chamber to said first hydraulic chamber in consequence to movement of said control piston from said release position toward said application position, thereby effecting said actuation of said power piston; and

(c) slack adjuster means for displacing a predetermined volume of hydraulic fluid from said first hydraulic chamber in response to movement of said control piston toward said release position, so as to effect retraction of said power piston a predetermined distance following actuation thereof, irrespective of the stroke traversed by said control piston between said release and application positions.

4,319,672

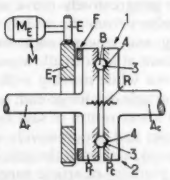
DEVICE FOR CONTROLLING THE ROTATION OF A DRIVEN ROTARY MEMBER

Andre J. Barthelemy, Saint Remy les Chevreuse, France, assignor to Societe Anonyme Automobiles Citroen and Automobiles Peugeot, both of Paris, France

Filed Nov. 13, 1979, Ser. No. 93,733

Int. Cl.[3] B60K *41/02*; F16D *13/04*

U.S. Cl. 192—0.02 R **14 Claims**



1. A device for controlling the rotation of a driven rotary member comprising an operating member adapted to drive the driven member positively and a frictional rotary assistance mechanism to facilitate the driving of the driven member, said device further comprising a rotary motion transmission device positioned between the operating member and the driven member comprising two plates coupled respectively to the operating member and to the driven member, at least one of said plates being axially slidable with respect to the other plate and having resilient return means urging said plates towards one another and balls being interposed between said plates, to cooperate with inclined surfaces provided on the plates, such that the relative rotation of one plate with respect to the other, causes, by the cooperation of the balls with the inclined surfaces, the axial displacement of at least one of said plates in the direction which separates said plate from the other, frictional coupling means being provided between an output of said assistance mechanism and at least one of said plates which is axially movable, the frictional coupling of the assistance mechanism only engaging said plurality of plates once a predetermined axial separation of said plates has occurred and when said frictional coupling is engaged with said plurality of plates the amount of friction between the output of the assistance mechanism and the frictional coupling increases with the amount of force required to drive the driven member.

4,319,673

CONTROL DEVICE FOR A BRAKE AND A DERAILLEUR FOR A BICYCLE

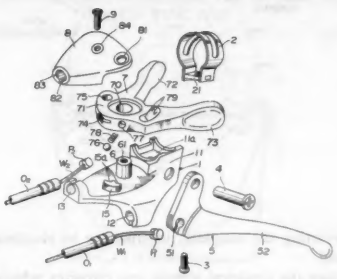
Masao Kojima, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Sep. 27, 1979, Ser. No. 79,459

Claims priority, application Japan, Oct. 6, 1978, 53-138288[U]

Int. Cl.[3] B62K *23/06*; B62L *3/02*; F16D *67/00*

U.S. Cl. 192—4 R **2 Claims**



1. A control device mounted to a handle bar for a bicycle near a grip of said handle bar so as to control a brake and a derailleur, said control device comprising:

a fixing member having fixing means attachable to said handle bar, said fixing member having a first pivot and a second pivot disposed substantially perpendicularly with respect to said first pivot, and having around said second pivot a flat surface perpendicularly intersecting the axis of said second pivot, said fixing member having at a handle bar grip side an upright portion connected with said fixing means said second pivot being disposed at the front side of said upright portion;

a brake lever pivoted to said first pivot and being swingable in the direction of approaching said handle bar, said brake lever having a supporting bore for supporting therethrough a terminal of a brake wire connected to said brake and a grip which is grippable by a driver to swing in the direction of approaching said handle bar and pull said brake wire to exert said brake; and,

a control lever pivoted to said second pivot at said fixing member, said control lever having a supporting bore for supporting a terminal of a control wire connected to said derailleur, and a boss having a through bore through which said second pivot projects, said control lever further having two control portions extending outwardly from the outer periphery of said boss, said control portions being positioned at both sides of said upright portion said control portions being positioned between said handle bar and said grip at said brake lever and being swingable in a direction perpendicular to the swinging direction of said brake lever, whereby said control lever is swingable to actuate said derailleur.

4,319,674

AUTOMATED TOKEN SYSTEM

Dean D. Riggs, Avon Lake, and David M. McCarthy, North Olmsted, both of Ohio, assignors to Electron, Inc., San Diego, Calif.

Filed Dec. 10, 1975, Ser. No. 639,228

Int. Cl.[2] G07F *1/06*

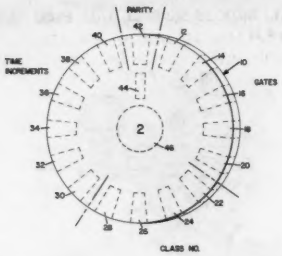
U.S. Cl. 194—4 R **6 Claims**

1. A process for controlling limited access areas comprising:

preparing a token which is magnetizable;

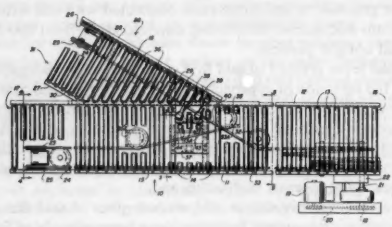
impressing information in the form of magnetic data bits on

the token through its entire thickness by submitting small areas of the token to magnetic fields;
distributing the token;
retrieving the token;
scanning the data bits on the token to decide which side of the token is being viewed;



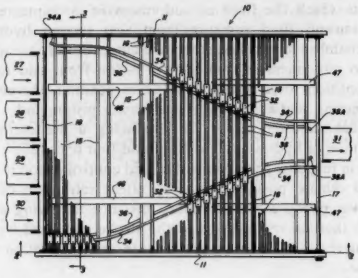
converting the magnetic information to electrical signals; and
feeding the electrical signals into circuitry which can process it in a readable manner.

4,319,675
ROLLER CONVEYOR
Harold L. Turnbough, St. Louis, Mo., assignor to Alvey, Inc., St. Louis, Mo.
Filed Oct. 22, 1979, Ser. No. 86,834
Int. Cl.³ B65G *47/46*
U.S. Cl. 198—367 **8 Claims**



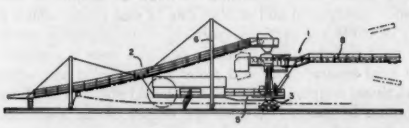
1. A roller conveyor comprising: a first series of cylindrical article supporting rollers; side means supporting the ends of said rollers in position forming a first path along which articles may be moved; a second series of cylindrical article supporting rollers; other side means supporting the ends of said second rollers in position forming a second path along which articles may be moved, said second path diverging from and having an article receiving end adjacent said one of said first side means supporting said first rollers in said first path; article diverting means operable independently of said first and second series of rollers and being disposed adjacent said article receiving end of said second path and powered for diverting articles from said first path to said second path; flexible propelling means extending continuously through said first and second paths; and means supporting said flexible means in operative positions for travel in first directions engaged with and propelling said first and second series of rollers for advancing articles supported thereon, said first direction of travel of said propelling means being in an opposite directional sense, and for travel in second directions corresponding with the travel of the articles and out of propelling engagement with said first and second series of rollers.

4,319,676
ARTICLE COMBINER CONVEYOR APPARATUS
Harold L. Turnbough, Lemay, Mo., assignor to Alvey Inc., St. Louis, Mo.
Filed May 2, 1980, Ser. No. 146,105
Int. Cl.³ B65G *47/68*
U.S. Cl. 198—449 **6 Claims**



1. Article combiner conveyor apparatus including: an array of article conveying members movable in an endless closed path in which said members are load bearing and form an upper surface for the support of the articles to be conveyed and follow a lower return path of travel, said members moving through said upper surface between an article receiving end and an article discharge end; article pushing means operatively mounted on said load bearing members and arranged in laterally spaced paired relation on said members so as to be initially spaced at the article receiving end of said upper surface; first guide means in said apparatus for cooperation with said pushing means, said first guide means being disposed in relation to said upper surface to progressively move said pushing means laterally on said members from the widely spaced relation at said article receiving end toward each other into a closer spaced relation sufficient at least to allow passage of articles in single file therebetween while moving with said load bearing members toward the article discharge end; second guide means cooperating with the lower return of said members for engaging said pushing means and progressively returning them to said initial widely spaced relation at the article receiving end of said upper surface; a plurality of article supply means adjacent said receiving end for delivering articles onto said upper surface from laterally spaced positions, said pusher means engaging the articles from the side thereof which is closest to the position of a pusher means as the articles and the pusher means travel with the array of conveying members for directing said articles laterally in paths along said upper surface which orient the articles for single file passage from said upper surface at substantially the same location adjacent the discharge end.

4,319,677
STOCKYARD TRANSPORTER AND TRIPPER CAR EQUIPMENT
Hans Kipper, Blieskastel, Fed. Rep. of Germany, assignor to PHB-Weserhutte AG, Fed. Rep. of Germany
Filed Sep. 29, 1980, Ser. No. 191,987
Int. Cl.³ B65G *37/00*
U.S. Cl. 198—585 **4 Claims**



1. Stockyard transporter and tripper car equipment which is

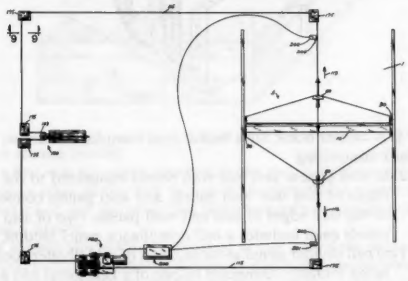
movable on rails disposed on both sides, comprising portal uprights provided with running gears, a tripper car frame and a boom, which is mounted so that it can be lifted and lowered and/or rotated, characterized in that the stockyard transporter (1) and the tripper car (2) constitute a mobile, rail-bound unit, the stockyard transporter (1) is supported in the tripper car (2) substantially without a counterweight, only one portal (3) having two uprights (4) is provided at the end remote from the tripper car (2), and a fixed connection (5) is provided between the portal (3) and one vertical support (6) of the tripper car (2) so that the tripper car acts substantially like a counterweight to improve the stability of the stockyard transporter.

4,319,678

MANURE CONVEYING SCRAPER APPARATUS

Andrew B. Hesler, Waterloo, Iowa, assignor to Farmstead Industries, Division of Farmhand, Inc., Waterloo, Iowa

Filed Feb. 20, 1980, Ser. No. 122,858
Int. Cl.³ B65G *25/10*
U.S. Cl. 198—746 **12 Claims**



1. A conveyor apparatus for removing manure from a building having one or more collection alleys, and a reversible driving means operably connected to a cable, said conveyor apparatus comprising:

a. a scraper blade;

b. runner means having a pivotal connection with said scraper blade;

c. a first stabilizer strut attached to said runner means;

d. a first guide means attached to said first stabilizer strut;

e. a second stabilizer strut connected to said runner means;

f. a second guide means connected to said second stabilizer strut; and

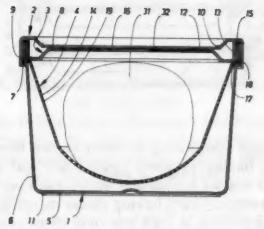
g. a drive linkage assembly, said drive linkage assembly including a first slide portion, a second slide portion, and a link means; said link means being pivotally attached to said scraper blade; said first slide portion being attached to said link means and movably connected to said first guide means; said second slide portion being attached to said link means and being movably connected to said second guide means, said drive linkage assembly including a first means for limiting the travel of said first slide portion with respect to said first guide means and further including a second means for limiting the travel of said second slide portion with respect to said second guide means; said drive linkage assembly being connected at a front end and a rear end to said cable such that when said reversible driving means moves said cable in a forward direction, said link means pivots said scraper blade downward to an operating position and said first and second travel limiting means apply forward forces to said first and second guide means, respectively, such that said scraper blade moves in said forward direction; and such that when said reversible driving means moves said cable means in a rearward direction, said link means pivots said scraper blade upward to a resting position, and said first and second travel limiting means applies a rearward force to said first and second guide means, respectively, such that said scraper blade is moved in said rearward direction.

4,319,679

STORAGE DEVICE FOR BODIES, WHICH SHALL BE EXPOSED TO THE ENVIRONMENT SUCH AS BODIES FOR THE ABSORPTION OF HUMIDITY

Bror Gustafsson, Gislaved, Sweden, assignor to Handelsbolaget Zeidler Holmgren, Göteborg, Sweden

Filed Mar. 31, 1980, Ser. No. 135,986
Claims priority, application Sweden, Jan. 16, 1980, 8000345
Int. Cl.³ F17C *1/00*
U.S. Cl. 206—0.5 **2 Claims**



1. A storage device for a body which is to be exposed to the environment such as for absorption of humidity, comprising:

an imperforate container having a bottom and a wall connected at one end thereof to said bottom and having an elongate skirt on another end thereof, said container skirt having an upper rim, and said container wall including an offset portion located near said skirt, said offset portion defining a first shoulder;

a body enclosing portion accommodated inside said container to prevent communication between a body stored inside said body enclosing portion and the environment, said body enclosing portion including a cup portion having a wall which includes a perforated dome-shaped portion and a curved wall, said curved wall having an upper rim and being offset from said dome-shaped portion to define a second shoulder, said dome-shaped portion having a body-supporting apex remote from said upper rim;

a support means having a perforate central section and an elongate wall having an upper rim which is offset from said central section, said support means wall being attached to said central section, said central section including a body-supporting section;

said second shoulder supported on said first shoulder and said body enclosing support means supported on said second shoulder so that said dome-shaped portion depends from said first shoulder into said container with the body supported on said dome-shaped portion;

said body enclosing portion and said support means being adapted to assume a second orientation wherein said dome-shaped portion is inverted with said upper rim supported by and contacting said first shoulder and said dome-shaped portion being located essentially completely outside said container, said support means being inverted with said support means upper rim supported by and contacting said first shoulder and said central section being located closely adjacent said container skirt upper rim, the body being supported by said support means central section to be located above said container with communication between that body and the environment being established via said perforate dome-shaped portion while communication between the body and the interior of said container is established via said perforated support means central section; and

an imperforate lid removably positioned on said imperforate container wall to close said container.

4,319,680

PACKAGING

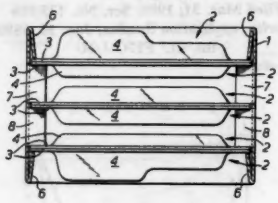
Christiaan K. Hiemstra, Amsterdam, Netherlands, assignor to Hiemstra Evolux B.V., Haarlem, Netherlands

Filed Jan. 14, 1981, Ser. No. 224,903

Claims priority, application United Kingdom, Feb. 1, 1980, 03536/80

Int. Cl.³ B65D *85/62, 5/06*

U.S. Cl. 206—45.14 6 Claims



1. A package comprising an outer carton formed as a one-piece sleeve having opposed open ends, and a plurality of display packs housed within said sleeve, each said display pack comprising a support card having planar marginal portions and means for supporting at least one item of merchandise within said marginal portions, said display packs each located within said sleeve with its support card extending transversely thereof and said carton comprising flap means integral with said carton and turned inwardly thereof to have supporting engagement with said marginal portions whereby to retain said packs in desired locations intermediate said ends of said sleeve.

4,319,681

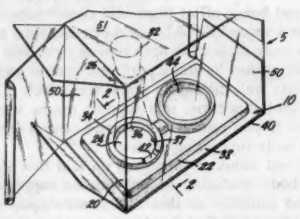
CONTAINER HOLDER AND METHOD OF PACKAGING

Arthur Gestetner, 1750, 58th St., Brooklyn, N.Y. 11204

Filed Apr. 28, 1980, Ser. No. 144,567

Int. Cl.³ B65D *85/42*

U.S. Cl. 206—45.19 6 Claims



1. A holder for securing a container releasably in a package including:

a section of sheet material;

a raised area of the section of sheet material;

the raised area defining an opening therethrough having a size dimensioned to engage tightly about a bottom portion of the container; and

a base member beneath the section of sheet material having an area thereof located closely below the opening through the raised portion for engaging and supporting the bottom of the container, wherein:

the sheet material is a formed plastic sheet;

the sheet has an outwardly extending peripheral flange secured to the base member, upwardly extending wall inward of the flange, and the walls terminating upwardly in a platform that is the raised area of the section of sheet material;

said opening being formed through the platform and having a downwardly projecting wall to provide an inside surface of the opening greater than the thickness of the sheet and for releasably holding the container in a friction fit therein.

4,319,682

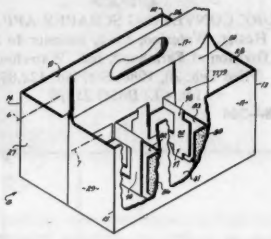
COMPLIANCE CARRIER

William H. Wright, Cincinnati, Ohio, and John M. Kruse, Newport, Ky., assignors to The C. W. Zumbiel Company, Cincinnati, Ohio

Filed Mar. 28, 1980, Ser. No. 134,959

Int. Cl.³ B65D *5/46, 5/48*

U.S. Cl. 206—180 20 Claims



1. A carrier blank for a basket type compliance carrier, said blank comprising

side wall panels, and end wall panels connected to the side edges of said side wall panels, and keel panels connected to the side edges of said end wall panels, two of said keel panels each includes a cell compliance panel section, and

two cell divider panel sections, each of said divider sections being foldably connected to one of a keel panel and a cell compliance section, each of said divider sections comprising at least two cell divider panels, the cell divider panels of each divider section cooperating with one side wall panel to provide a row of cells when said carrier is assembled and erected, thereby providing two side-by-side cell rows,

each of said compliance sections comprising at least two cell compliance panels, the cell compliance panels of each compliance section cooperating with one cell divider panel section to provide a double thickness in the keel and shoulder areas of the cell divider panels of adjacent cells, and

each cell divider panel cell section and each cell compliance panel section being positioned in said blank relative to its associated side wall panel so that, when said blank progresses through a gluing machine in the machine direction for assembly into a knock-down carrier structure from said carrier blank structure, said cell divider panels and cell compliance panels within each associated pair of cell divider and cell compliance panel sections are glued one to the other in double thickness form upon folding one section in a cross machine direction relative to the other section without folding back of any glue tabs or panels within any of said sections.

4,319,683

PORTABLE CONVERTIBLE CASE AND WORK TRAY

Joseph F. Correa, III, P.O. Box 755, Kailua, Hi. 96734

Filed Sep. 2, 1980, Ser. No. 183,432

Int. Cl.³ B65D *85/28, 25/28*

U.S. Cl. 206—349 4 Claims

1. A portable convertible case and work tray comprising:

a. an open topped box;

b. a first hinge means, one leg of which is operatively attached to and along one open edge of said box;

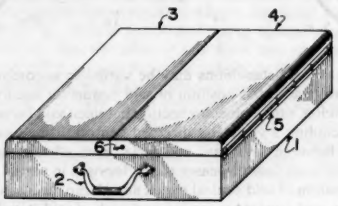
c. a second hinge means, one leg of which is attached to the

open edge of said box opposite that edge of said box to which the first hinge means is attached;

d. a first substantially rigid door operatively attached along one edge to the leg of said first hinge means which is not attached to the box, said first door being of such length and width as to substantially cover the half of the open face of said box adjacent to said first hinge means;

e. a second substantially rigid door operatively attached along one edge to the leg of said second hinge means which is not attached to the box, said second door being of such length and width as to substantially cover the half of the open face of said box adjacent to said second hinge means;

f. a first handle operatively attached to the box on the outside face of one sidewall of the box;



g. a second handle;

h. a first arm pivotably attached at one end of the arm to the open edge of the box to which the first hinge means is attached and the other end being operatively attached to said handle;

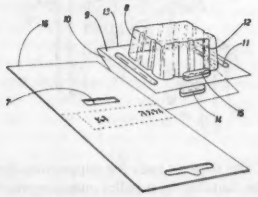
i. a second arm pivotably attached at one end of the second arm to the open edge of the box to which the second hinge means is attached and the other end being operatively attached to said handle so as to place the handle centrally over the open box when the doors are open; whereby when the doors are open the case becomes a work tray carried by the second handle and when the doors are closed, the case may be carried by the first handle.

4,319,684

PACKING, METHOD FOR ITS MANUFACTURE AND MEANS FOR CARRYING OUT SAID METHOD OF MANUFACTURE IN PRACTICE

Erik E. Backman, Gothenburg; Ulf A. Henrekson, and Inge L. Nertman, both of Kungälv, all of Sweden, assignors to Aktiebolaget Volvo, Sweden

Filed Jul. 6, 1979, Ser. No. 55,428
Claims priority, application Sweden, Jul. 7, 1978, 7807628
Int. Cl.³ B65D *73/00*
U.S. Cl. 206—464 **12 Claims**



1. A resealable package, comprising:

a first, transparent member having a receptacle portion with an opening, a brim around the opening of the receptacle portion and structure forming one part of a snap-in lock formed in the brim;

a second, flat member substantially co-extensive with and foldably connected to the transparent member along an edge of the brim opposite the snap-in lock structure, the second member having structure forming the other part of the snap-in lock, the first and second members being thereby detachably connectable, the brim lying flat against the second member when so connected; and,

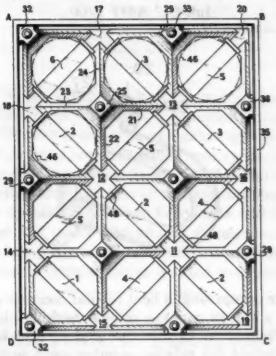
a removable sheet member, of relatively stiff material, interposed fully between the first and second members, and extending from the fold, over the brim and the opening, and past the snap-in lock structure for reinforcing both the receptacle portion and the brim, the removable member having an aperture through which only a portion of only the snap-in lock structure projects, whereby all of said members are held securely but releasably together.

4,319,685

OPENWORK CRATE FOR TRANSPORTING BOTTLES OR THE LIKE

Pierre A. David, 18 Rue Jacquot Defrance, 54520 Laxou, France

Filed Jan. 10, 1980, Ser. No. 111,066
Claims priority, application France, Jan. 17, 1979, 79 01118
Int. Cl.³ B65D *21/04, 1/24*
U.S. Cl. 206—507 **13 Claims**



1. A rectangular openwork crate which is capable of being nested in another identical crate in a nesting position and is stackable with said other identical crate when turned about a vertical centre axis of the crate from the nesting position, the crate comprising in combination a horizontal apertured bottom portion of the corresponding pyramids of said other crate in said nesting position.

4,319,686

SKI HOLDER

Marcel A. Avocat, Place de l'Eglise, Areches (Savoie), France

Filed Nov. 21, 1979, Ser. No. 96,495
Claims priority, application France, Nov. 23, 1978, 78 34037
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—60 SK **10 Claims**

1. A ski holder comprising:

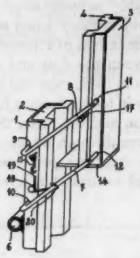
a vertically elongated and fixed guide;

a vertically elongated and movable guide adjacent said fixed guide and having a lower end;

an abutment on said lower end projecting toward said fixed guide;

means including a link extending between said guides for displacement of said movable guide parallel to said fixed

guide between an upper open position spaced horizontally relatively far from said fixed guide and a lower closed



position spaced horizontally relatively close to said fixed guide.

4,319,687

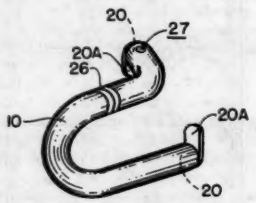
BATHROOM AND KITCHEN FIXTURES

James R. Hull, 148 S. Westgate Ave., Los Angeles, Calif. 90049

Continuation of Ser. No. 87,203, Oct. 22, 1979, abandoned. This application Oct. 30, 1980, Ser. No. 202,335

Int. Cl.³ A47F 7/00

U.S. Cl. 211—105.2 **2 Claims**



1. A fixture comprising: a bent tubular member constituting a holder for a roll of paper; a tubular bushing-like mounting bracket configured to fit into one end of said bent tubular member to mount the tubular member on a wall, said bent tubular member having a U-shape and having a free end displaced outwardly from the plane of the wall, said tubular member being in sections; coupling means interposed between the two sections of said tubular member to couple the sections together and to permit the sections to be turned relative to one another, said coupling means comprising a pair of said mounting brackets extending into the respective adjacent ends of the two sections, and means securing said pair of mounting brackets together in aligned coaxial relationship; and a base for said first-named mounting bracket for engaging the surface of the wall, said base extending radially beyond the peripheral surface of said bracket, and a mounting screw extending through the base and into the wall for attaching the bracket to the wall.

4,319,688

ADJUSTABLE MARKETING DISPLAY DEVICE

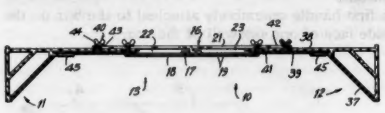
Michael Wahl, Roslyn, N.Y., assignor to Marlboro Marketing, Inc., New York, N.Y.

Filed Jan. 14, 1980, Ser. No. 111,951

Int. Cl.³ A47F 5/00

U.S. Cl. 211—175 **8 Claims**

1. A lengthwisely adjustable marketing display device comprising, in combination, a pair of vertical end stanchions constituting mirror images of each other and arrayed in spaced opposed relation, each said stanchion including at its upper and lower distal ends a rear wall, a vertical outer side wall perpendicular to said rear wall, a vertical front wall extending from the front of said stanchions toward the rear thereof at an acute angle relative to said side wall, said front wall terminating in a plane forward of said rear wall, said stanchions, between the rearmost end of said front wall and said rear wall, defining a notch configuration extending in a direction parallel to said rear wall, said stanchions being arranged with their front walls converging in a rearward direction and with said notches in coplanar alignment, a connector section disposed between said stanchions, said connector section including a base portion and a facia portion in vertically spaced parallel relation to said base portion, the distal ends of said connector section being slidably disposed within said notches of said stanchions whereby the



spacing of said stanchions may be varied in accordance with the relative adjusted position of said connector section within said notches, said connector section between said facia and said base including a vertically directed central display panel connected between said base and facia, each of said stanchions including a vertical dispenser panel disposed in partial overlapping position of said central panel, and clamp means interposed between said connector section and each of said stanchions for locking said dispenser panels in a selected overlapped position relative to said central panel and locking said distal ends of said connector section at a selected position within said notches, thereby adjustably to control the longitudinal extent of said device.

4,319,689

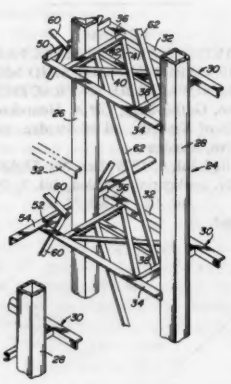
STORAGE RACK

Daniel W. Clapp, Hackettstown, N.J., assignor to Frazier Industrial Company, Long Valley, N.J.

Filed Sep. 13, 1979, Ser. No. 63,580

Int. Cl.³ A47F 5/00

U.S. Cl. 211—182 **7 Claims**



1. In a high rise storage rack for supporting loads on pallets or the like to be handled by a pallet engaging mechanism of an automated storage and retrieval system, said storage rack having a plurality of individual vertical frames spaced apart in the down-aisle direction and extending laterally between a rear end of the frame and a front end of the frame adjacent an aisle through which the automated storage and retrieval system operates, each of said vertical frames comprising a vertically extending rear column located adjacent the rear end of the frame and a vertically extending front column located adjacent

the front end of the frame, said storage rack also including a plurality of down-aisle tie means extending between the rear columns of said vertical frames to brace the same against down-aisle forces and lateral column buckling, the improvement comprising:

a plurality of braced frame assemblies on each of said vertical frames, said braced frame assemblies being spaced apart vertically on said vertical frames to extend horizontally between said front and rear columns at a plurality of load supporting levels, the braced frame assemblies on each vertical frame being located in horizontal alignment with braced frame assemblies on adjacent down-aisle vertical frames to provide load support at said levels, said braced frame assemblies being secured to said rear and front columns to brace said front column against down-aisle forces and lateral column buckling,

each of said braced frame assemblies including a pair of load rails extending horizontally between the front and rear ends of the vertical frame and being spaced apart and located on opposite sides of said front and rear columns for providing a support for the pallets or the like,

the front columns of adjacent down-aisle frames providing a complete clearance space therebetween at said load supporting levels of said braced frame assemblies to permit the unobstructed entry of the pallet engaging mechanism of the automated storage and retrieval system for engaging a pallet or the like supported on said load rails of said braced frame assemblies.

4,319,690

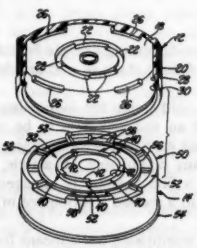
CHILD-RESISTANT CLOSURE AND CONTAINER ASSEMBLY INCLUDING IMPROVED OUTER CAP

Stewart H. Birrell, Misissauga, and Peter Hedgewick, Windsor, both of Canada, assignors to International Tools (1973) Limited, Windsor, Canada

Continuation-in-part of Ser. No. 187,096, Sep. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 103,308, Dec. 13, 1979. This application Nov. 14, 1980, Ser. No. 206,411

Int. Cl.³ B65D *55/02*

U.S. Cl. 215—220 **22 Claims**



1. A safety closure assembly comprising: an inner cap having a dome-shaped top panel with a skirt portion projecting axially therefrom, said depending skirt portion having cap locking means formed on the inner surface thereof and adapted to be engaged with and disengaged from complementary container locking means on a container; an outer cap having an end wall with a second skirt portion projecting axially from the periphery thereof, said second skirt portion loosely encompassing the first skirt portion to allow relative rotary movement between the inner and outer caps; clutch means operatively associated with the inner surface of the outer cap and the outer surface of the inner cap and coupling the inner and outer caps in one position of axial displacement of said inner and outer caps and uncoupling the inner and outer caps in a second axial position of said inner and outer caps; ratchet lug means circularly disposed on one of said inner and outer caps and interposed said caps; a plurality of inclined detent members circularly disposed on one of said inner and outer caps and interposed said caps; said dome-shaped top panel providing a biasing force to maintain the inner and outer caps in said second axial position; said detent members drivingly engaging said ratchet lug means in said second axial position to drive the inner and outer caps as a unit in the tightening direction of the closure and slipping over said ratchet lug means in the untightening direction to prevent unscrewing of said inner cap; downward axial pressure on said outer cap overcoming the bias of said dome-shaped top panel by causing a portion of said outer cap to deform the dome-shaped panel to place the inner and outer caps in the first axial position; and retaining means for loosely retaining said inner cap within said outer cap in a radial direction.

4,319,691

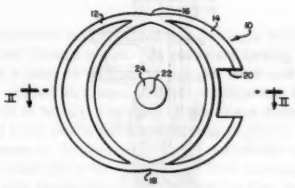
CUP LID

Erwin Hament, 5322 Roosevelt Ave., Woodside, N.Y. 11377

Filed Nov. 24, 1980, Ser. No. 209,685

Int. Cl.³ A47G *19/22;* **B65D** *41/26*

U.S. Cl. 220—90.4 **3 Claims**



1. A cup lid for fitting the lip of a cup comprising a first circular sealing flange fittable over an entire circumference of said lip and effective to seal said cup against spillage of spillable material therefrom, a second circular sealing flange intersecting said first circular sealing flange fittable over said lip and forming together with said first circular sealing flange a figure-8 outline, an opening in said cup lid outside said first circular sealing flange and inside said second circular sealing flange, said opening being effective to dispense material from said cup when said second circular flange is fitted over said lip.

4,319,692

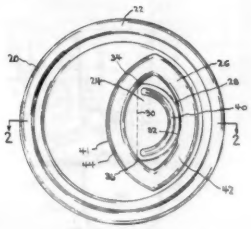
LITTER FREE PROTECTIVE BEVERAGE CAN LID

Roy L. Gundlach, 8739 Townhill Dr., St. Louis, Mo. 63126

Filed Jun. 23, 1980, Ser. No. 162,084

Int. Cl.³ B65D *17/32*

U.S. Cl. 220—268 **14 Claims**



1. A litter free beverage can lid comprising a circular metallic substantially flat base connected to an upstanding circular rim surrounding said base, said base being provided with a tab substantially coplanar with said base and having a free substantially semi-circular arcuate edge underlying a substantially semi-circular arcuate edge on said base defining a substantially semi-circular arcuate tab opening when said tab is pushed downward to present said opening for discharge of contents, sealing means on said underlying tab arcuate edge on the un-

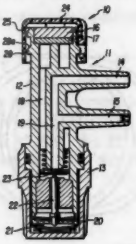
derside of said base, hinge means extending between the arcuate edge of said tab and a protective boss extending completely around said tab positioned inwardly of said rim and extending above said flat base and above said tab to a height not exceeding the height of said circular rim and closely surrounding said tab to protect said tab from accidental contact by other beverage cans.

4,319,693

FILTER CAP

Nobuyuki Hashimoto, and Atsushi Satomoto, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 19, 1980, Ser. No. 188,736
Claims priority, application Japan, Sep. 19, 1979, 54-129674
Int. Cl.[3] B65D *51/16*
U.S. Cl. 220—373 7 Claims



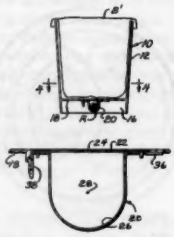
1. A filter cap made of resinous material, said filter cap comprising:
a ceiling wall member;
a circumferential wall member;
atmospheric port means formed in said circumferential wall; and
edge means having a slanting surface formed on said circumferential wall member.

4,319,694

REFUSE RECEPTACLE WITH RENEWABLE LINERS

Joel M. Nehrbass, 600 S. Main St., West Bend, Wis. 53905, and Gary J. Dorzok, 408 River Dr., West Bend, Wis. 53095

Filed Oct. 14, 1980, Ser. No. 196,638
Int. Cl.[3] B65F *1/06*; B65D *25/16*
U.S. Cl. 220—407 9 Claims



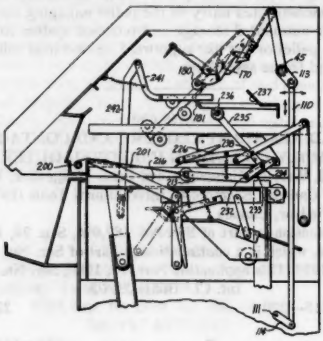
1. A refuse receptacle comprising an open top container having an upstanding sidewall and a bottom wall spaced above the pedestal-constituting lower edge of said sidewall, said bottom wall containing a depending bin for storage of a roll of end-to-end connected bags which are used individually for lining the interior of the container, said bottom wall containing a generally rectangular-shaped opening through which a roll of bags can be inserted into the bin, the bin having a generally cylindrical-shaped seat on which the inserted roll of bags rests with its axis disposed generally parallel to the axis of said bin and a bin cover for closing said opening comprised of molded plastic and of a rectangular shape whose dimensions exceed those of the opening in the bottom wall of the container which it closes, said bin cover containing a slot through which one end of the roll of bags is guided into the interior of the container, the container bottom wall having spaced slots along two opposed sides of the rectangular-shaped opening therein, and the bin cover having tabs along its two corresponding sides which extend through said slots and frictionally catch with the container bottom wall so as to releasably lock said bin cover in closed position over said opening.

4,319,695

VENDOR FOR FLAT ARTICLES

Lyle V. Dutro, 1908 Meadowbrook, Altadena, Calif. 91001

Continuation-in-part of Ser. No. 864,773, Dec. 27, 1977, Pat. No. 4,216,877. This application Mar. 4, 1980, Ser. No. 127,048
The portion of the term of this patent subsequent to Aug. 12, 1997, has been disclaimed.
Int. Cl.[3] B65H *5/16*
U.S. Cl. 221—213 27 Claims



1. A vendor for dispensing a single flexible, substantially flat article at a time from a stack of said articles, comprising:
a frame;
a platform on said frame for supporting a stack of articles from which an end article is to be dispensed, said end article having a surface with an edge;
separator means comprising an article engaging member movable to a first position in engagement with said end article, and to a second position not in engagement therewith;
release means comprising latch means for holding said article engaging member in said second position, and means for releasing said article engaging member to move to said first position;
support means mounted to said frame supporting said article engaging means for movement which movement has one component extending along said surface and away from said edge, and another component extending away from said surface and away from said edge, whereby to lift said edge of said end article in a peeling type movement from said edge while said article engaging member is in said first position;
conveyor means mounted to said frame and insertable beneath the lifted edge of said end article while part of said article rests on the article next beneath it in the stack, thereafter to convey said end article away from said stack after the article is released by the article-engaging means; and
actuator means mounted to said frame which, when permitted to function, releases said latch means to enable said article engaging member to engage said end article adja-

cent to said edge, move the support means to cause the article engaging member to lift said edge in said peeling-type movement, move the conveyor means past said edge and underneath at least a part of said end article, release said article from said article engaging member, and move said conveyor means with the end article away from the stack.

4,319,696

ARTICLE HOLDER AND DISPENSER

Noel W. Stevens, Palo Alto, Calif., assignor to Safe-T Pacific Co., Redwood City, Calif.

Filed Sep. 10, 1979, Ser. No. 73,929
Int. Cl.[3] A47F *1/04*; G07F *11/16*
U.S. Cl. 221—310 5 Claims

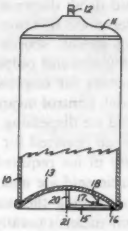
1. An article holder and dispenser for storing dispensing nested articles such as ice cream cones, cups and the like including articles of the type having a top section, a smaller bottom section and an intermediate transverse shoulder, said article holder and dispenser comprising a vertically extending cylindrical, hollow housing for containing a stack of said nested articles, said housing defining a discharge opening at its bottom end for passage of said contained articles and a plurality of through holes circumferentially spaced around its periphery a predetermined distance above said discharge opening, and an arrangement for releasably retaining said stack within said housing, said arrangement including an equal plurality of integral article retaining clips, each of which includes a central segment located adjacent the exterior of said housing between said through holes and discharge opening, a lower segment extending under said container and into said discharge opening for engagement with the transverse shoulder of the lowermost article prior to withdrawal of the latter from said container and an upper segment extending into said container through a corresponding one of said through holes for loose engagement with the top section of the next adjacent article prior to withdrawal of the lowermost article, and resilient means bearing radially inwardly against the outer surfaces of the central segments of said clips such that the lower segments of latter are movable outward against the urging of said lowermost article as the latter is withdrawn from said housing through said discharge opening while, at the same time, said central segments are urged outwardly and said upper segments are urged inward for tightly engaging the top section of the next adjacent article and retaining the latter in place above the discharge opening until the lowermost article is entirely withdrawn from the latter and out of engagement with said lower segments.

4,319,697

AEROSOL CAN PRESSURE RELEASER

Robert E. De Barth, 1337 N. Broad St., Lansdale, Pa. 19446

Filed Apr. 14, 1980, Ser. No. 140,303
Int. Cl.[3] B65D *83/14*
U.S. Cl. 222—80 7 Claims



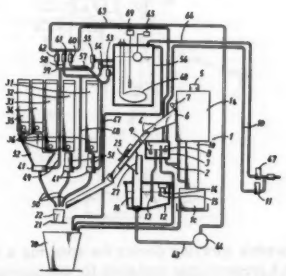
1. A pressurized aerosol spray can having a cylindrical side wall and end closure plates, one end plate having a manually depressible release valve therein and the other end plate being concavely dished in shape, and in combination therewith a lever which is totally disposed in the space formed by said dished end plate and is permanently and yieldably attached at one of its ends to the can and extends therefrom to lie spaced from the dished end plate surface, the lever having a puncture pin on its side facing the dished surface so that movement of the permanently attached lever toward the can will cause the pin to enter and puncture the can.

4,319,698

AUTOMATIC CUP DRINK VENDING MACHINE

Muneo Tomiyama, Nara; Keiichi Mizugane, Yao; Kazunori Taniguchi, Osaka; Toshio Nonaka, Izumisano, and Hidenori Oodoi, Suita, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Dec. 26, 1979, Ser. No. 107,047
Claims priority, application Japan, Aug. 30, 1979, 54-112698; Aug. 31, 1979, 54-120848[U]
Int. Cl.[3] B67D *5/62*
U.S. Cl. 222—129.1 29 Claims



1. An automatic cup drink vending machine for preparing a cup for vending, putting a source material, cold water and ice into the cup to produce a mixture, thereby to dispense the mixture as a cold drink, comprising: water supplying means for supplying water, ice making means for making ice from the water supplied by said water supplying means, cold drink dispense commanding means for commanding dispensing of said cold drink, first ice dispensing means responsive to the output of said cold drink dispense commanding means for dispensing a predetermined quantity of the ice made by said ice making means into said cup, cold water making means having

a cold water tank and an ice storing portion located at least partially inside said cold water tank for storing said ice and for causing said stored ice to cool the water in said cold water tank supplied from said water supplying means, second ice dispensing means for dispensing the ice made by said ice making means into said ice storing portion of said cold water making means, cold water dispensing means responsive to the command output of said cold drink dispense commanding means for dispensing a predetermined quantity of cold water from said cold water making means, source material dispensing means responsive to the command output of said cold drink dispense commanding means for dispensing a predetermined quantity of source material, control means for controlling said ice making means and said ice dispensing means in accordance with the quantity of the ice required for being dispensed into said cup and the quantity of ice required by said cold water making means and wherein said ice making means comprises sustain tank means for receiving the water from said water supplying means, conduit means operatively connecting said sustain tank means to the inside of said ice making means for maintaining a constant water level inside of said ice making means, and further conduit means operatively connecting said cold water tank means with said sustain tank means for supplying said cold water tank means with water from said sustain tank means.

4,319,699

PORTABLE SPRAYER ACTUATED BY USER'S BODY MOVEMENT

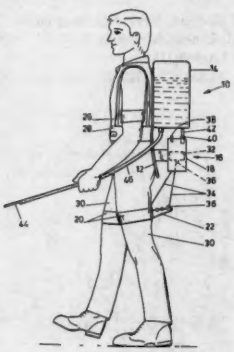
Albertus V. Z. Willers, Pretoria, and Willem J. Neser, Kempton Park, both of South Africa, assignors to D.A.S. Pumps (Proprietary) Limited, Sandton, South Africa

Filed Jun. 25, 1980, Ser. No. 162,922

Claims priority, application South Africa, Jun. 25, 1979, 79/3160

Int. Cl.³ B67D *5/64, 5/42*

U.S. Cl. 222—175 **3 Claims**



1. A portable spraying device for spraying a liquid, which comprises a pressurizable container for containing the liquid to be sprayed, attachment means for locating the container on the back of the user, a pump connected to the container and having a cylinder and a piston disposed in the cylinder for pressurizing the container, means to move the piston within the cylinder comprising a thigh band for securing to a thigh of the user and a lever arm attached to the thigh band so as, in use, to extend rearwardly and away from a user's leg in the generally vertical plane of movement of the leg during walking, means connecting the lever arm to one of the piston and the cylinder at a point spaced from the point of attachment of the lever arm to the thigh band so as to effect relative movement between the piston and the cylinder during walking.

4,319,700

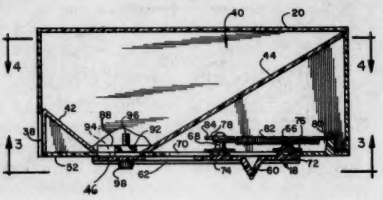
MULTI-SIZE PILL DISPENSER

Richard A. Celender, and Alexander Fedorovich, both of 2164 Almshouse Rd., Jamison, Pa. 18929

Filed May 30, 1978, Ser. No. 910,482

Int. Cl.³ B65D *83/04*

U.S. Cl. 222—511 **3 Claims**



1. In an article dispenser suitable to dispense articles of different sizes, the combination of

a cabinet comprising at least one opening of a first configuration, and at least one article-containing hopper including funnel means to converge articles downwardly toward said opening; and

adjustable valve means underlying the cabinet at said opening to permit articles to be dispensed from the hopper through the opening,

said valve means comprising a slide reciprocally moveable between a rearward article-storing position and a forward article-dispensing position and having a window therein of a second configuration, at least a part of said window being pulled into registry beneath the opening when the slide is urged to its forward position to dispense at least one article,

said valve means being adjustable by means of an abutment projecting from the cabinet and a stop on said slide, the abutment and said stop being aligned to permit the stop to contact the abutment upon each forward movement of the slide to the article-dispensing position to limit the forward extent of travel of the slide,

said abutment comprising means to adjust the position thereof relative to the cabinet to permit variation in the limit of forward travel of the slide by relocation of said abutment in any position between a first adjusted position wherein the entire slide window is in registry below the hopper opening and a second adjusted position wherein none of the window can be pulled into registry below the hopper opening, the improvement comprising,

said cabinet being provided with a first elongated slot within which a portion of said valve means is adapted to reciprocate longitudinally, and

a second elongated slot laterally offset from said first slot, a portion of the means to adjust the abutment position being longitudinally adjustable within said second slot.

4,319,701

BLOW MOLDED CONTAINER HAVING AN INSERT MOLDED IN SITU

Orlando D. Cambio, Bristol, Wis., assignor to Respiratory Care, Inc., Arlington Heights, Ill.

Division of Ser. No. 886,714, Mar. 15, 1978, Pat. No. 4,213,933. This application May 30, 1979, Ser. No. 43,725

Int. Cl.³ B65D *47/10*

U.S. Cl. 222—541 **5 Claims**

1. A container comprising:

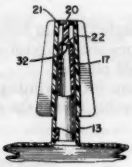
(a) a hollow body blow molded from an extruded tubular parison of thermoplastic material;

(b) said hollow body having a first end and a second end;

(c) at least one insert within said hollow body;

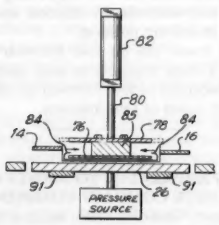
(d) said insert having a body portion;

(e) said body portion of said insert having an outwardly radially extending surface;
(f) said body portion of said insert having a stem extending axially with respect to said hollow body;
(g) a portion of said hollow body having a radially inwardly indented portion sufficient to sealingly adhere to at least a portion of said outwardly radially extending surface of said body portion of said insert;



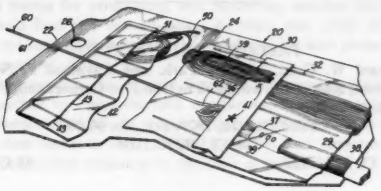
(h) an encircling weakened portion adjacent one side of said indented portion whereby a part of the hollow body including one of the ends may be broken away and said stem terminates in that end whereby the stem may be broken away from the body portion of the insert when the said part of the hollow body is broken away.

4,319,702
POCKET CREASING APPARATUS AND METHOD OF CREASING WITH SAME
Harold Preston, Clifton, N.J., assignor to Automated Components, Inc., Belleville, N.J.
Filed Sep. 10, 1979, Ser. No. 73,676
Int. Cl.³ A41H *33/00*
U.S. Cl. 223—38 **12 Claims**



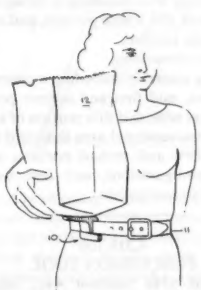
1. In an apparatus for forming and maintaining a fabric piece in a desired configuration comprising
(a) forming means for forming the fabric piece into the desired configuration in which parts of the surface of said fabric piece are opposed;
(b) heating means for applying heat to the fabric piece; and
(c) pressure means comprising upper pressure means and lower pressure means for bringing together at least said parts of said surface of the formed fabric piece which are opposed under sufficient pressure to cause the desired configuration of the formed fabric piece to be maintained, the improvement comprising said upper pressure means comprising a die assembly comprising upper and lower opposed die members disposed in respective parallel planes operative to be moved from a first position to a second position into contact with the formed fabric piece, and linking means linking said opposed die members in spaced relationship.

4,319,703
NEEDLEWORK THREAD HOLDER AND ORGANIZER
Bonnie L. Gann, P.O. Box 338, Stockbridge, Ga. 30281
Filed Mar. 3, 1980, Ser. No. 126,685
Int. Cl.³ A41H *31/00*
U.S. Cl. 223—106 **13 Claims**



1. A needlework thread or yarn holder comprising a base sheet, a yarn retaining sheet disposed over said base sheet, said base sheet being larger than said yarn retaining sheet and said yarn retaining sheet being disposed within the confines of said base sheet, strips disposed in spaced, parallel, transverse relationship securing said yarn retaining sheet to said base sheet, said strips defining with said base sheet and said yarn retaining sheet a plurality of transversely extending parallel main pockets, opened at their ends for receiving and retaining yarn skeins respectively therein, and indicia receiving means carried by one of the sheets in a position adjacent to a plurality of said pockets for receiving symbol markings which respectively designate the yarn of said skeins in the respective pockets, said indicia receiving means and said yarn retaining sheet being on the same side of said base sheet whereby they may be simultaneously observed.

4,319,704
SUPPORT MEMBER
Louis M. Rosen, 7 E. 14th St., New York, N.Y. 10003
Filed Oct. 20, 1980, Ser. No. 198,835
Int. Cl.³ A45F *5/00*
U.S. Cl. 224—270 **3 Claims**



1. A package support member suitable for engagement with a person's belt to assist in supporting large or heavy packages which comprises
an upper substantially flat extension surface for engaging and supporting the package, said substantially flat extension surface being upwardly inclined with respect to a horizontal plane in the unloaded state, the angle of inclination being sufficient to allow said upper surface to assume a substantially horizontal position in the loaded state;
a generally vertical section depending downwardly from the inward end of said upwardly inclined upper extension surface, said vertical section including on the forward face thereof a generally U-shaped slotted opening having the

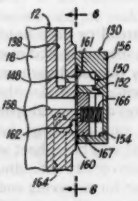
open end thereof disposed at the lowermost portion of said vertical section to facilitate engagement of said support on a person's belt, and a body engaging section having associated therewith a compressible surface adapted to evenly distribute the load of the package against the body of the wearer.

4,319,705

FASTENER DRIVING TOOL

Bernard W. Geist, Melrose Park, and Raymond F. Novak, Itasca, both of Ill., assignors to Duo-Fast Corporation, Franklin Park, Ill.

Filed Oct. 31, 1979, Ser. No. 90,009
Int. Cl.³ B25C 1/04
U.S. Cl. 227—120 **35 Claims**



1. A fastener magazine assembly for a fastener driving tool, comprising

first and second identical housing portions, said first and second housing portions defining a discharge opening for fasteners to be mounted at a predetermined position on said fastener driving tool,

identical attachment portions on each of said first and second housing portions, and

means on said fastener driving tool for detachably securing said magazine to said fastener driving tool in at least two different positions wherein said discharge opening is located at said predetermined position in each of said two different positions.

4. A fastener driving tool including a casing defining a pressurized fluid reservoir and a nose portion, and a fastener driver mounted in said nose portion,

the improvement comprising

a fastener feeding assembly including a piston with first and second portions, said first and second portions being of differential areas with said first portion of said piston being of a greater cross-sectional area than said second portion, wherein said first and second portions are of different geometrical configurations, and first and second feed pawls secured to said piston.

4,319,706

PERCUSSION TOOL

Donald B. Halstead, 1516 Salrimar Ave., San Dimas, Calif. 91773

Continuation of Ser. No. 961,619, Nov. 17, 1978, abandoned, which is a continuation of Ser. No. 747,786, Dec. 6, 1976, which is a continuation of Ser. No. 565,542, Apr. 7, 1975. This application Jan. 3, 1980, Ser. No. 109,237
Int. Cl.³ B25C 1/04
U.S. Cl. 227—126 **1 Claim**

1. A nail driving tool comprising:

a tool body having a cylinder and piston movable in the cylinder through a working stroke and a return stroke;

a plunger-like hammer extending from the cylinder to the exterior of the body for driving a nail during the work stroke;

mean for selectively pressurizing the cylinder and piston to drive the piston through a working stroke;

a removeable nail magazine containing a strip of nails being joined to each other at a central location;

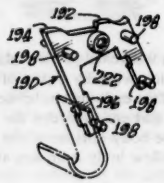
said magazine having a longitudinally extending slot in the lower side thereof through which project pointed ends of the nails;

a follower mounted in said magazine for sliding movement and having a leading edge;

spaced nail engaging portions on said leading edge of said follower for engaging the rear nail of said strip of nails at opposite sides of said centrally joined portions of the rear nail;

a spring means connected to said follower and biasing said follower to slide forwardly to push said nails into position for being hit by said plunger;

means on said magazine for interfitting with portions of said tool body to removably mount the magazine thereon;



a finger piece connected to said follower and located beneath and projecting downwardly below and covered by said magazine for travel beneath said slot in the lower side of said magazine to allow the follower to be pulled rearwardly to extend said spring means;

and means projecting through said slot to join said finger piece and said follower,

said tool body having a front end fitting containing a longitudinally extending slot defined by a pair of laterally projecting tongue-like flanges;

shoulder-like anvils on the inner confronting sides of said flanges adjacent said slot for supporting the heads of a plurality of nails immediately adjacent and following the leading nail in driving position,

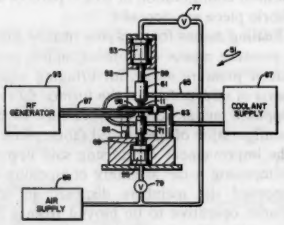
an upper and lower pin on said follower for projecting laterally for sliding engagement with said magazine, and stop means mounted on said follower for abutting said tool body to limit travel of said follower.

4,319,707

BRAZING APPARATUS TO MANUFACTURE COMPOSITE COMPACT COMPONENTS

Friedel S. Knemeyer, Granville, Ohio, assignor to General Electric Company, Worthington, Ohio

Division of Ser. No. 868,357, Jan. 10, 1978, Pat. No. 4,225,322. This application Dec. 10, 1979, Ser. No. 102,168
Int. Cl.³ B23K 31/02
U.S. Cl. 228—46 **2 Claims**



1. An improved brazing apparatus for bonding an abrasive

composite compact, selected from cubic boron nitride and diamond composite compacts, to a substrate, using a brazing filler metal having a liquidus substantially greater than 700° C., said apparatus comprising: a frame, a localized heating means attached to said frame; a pair of vertically opposed, moveable cylinders attached to said frame, the upper cylinder comprising a plunger having a recessed head for receiving one end of the composite compact and the lower cylinder comprising a plunger with a head; and a driving means for raising and lowering said cylinders, whereby the component braze joint is positioned for localized heating; wherein the improvement comprises:

(a) a heat sink which maintains the temperature of the diamond or cubic boron nitride below its degradation temperature, said heat sink comprising the head of the upper cylinder which head is provided with a coolant;

(b) a lower cylinder head provided with a coolant flowing therethrough and which head is adapted to receive a;

(c) ceramic insulator which supports the substrate.

4,319,708

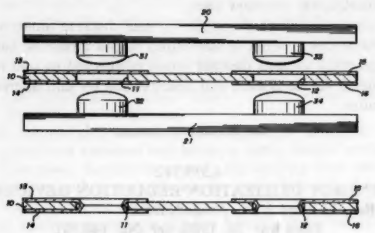
MECHANICAL BONDING OF SURFACE CONDUCTIVE LAYERS

Robert B. Lomerson, Rte. 9, Box 196, Fort Worth, Tex. 76106

Continuation-in-part of Ser. No. 768,735, Feb. 15, 1977, abandoned. This application Nov. 15, 1978, Ser. No. 961,005

Int. Cl.³ B23K *20/02, 20/10, 20/14*

U.S. Cl. 228—111 **48 Claims**



1. A method for establishing an electrically conductive path through an insulating plate which comprises the steps of:

(a) forming a hole through said plate,

(b) placing conductive material over each opening of said hole and in flush contact with each surface of said plate, and

(c) disposing the assembly in a press with said through holes located between opposed non-planar pressing members.

(d) applying pressure to cause said conductive material to merge and flow outwards between pressing members to produce a cold weld.

3. The method of claim **1**, wherein the opposed pressing members are pressed substantially together to provide a through hole in the conductive material.

7. A method for forming an electrically conductive through-hole in an insulating plate comprising the steps of:

(a) forming a hole through said plate;

(b) placing conductive material over each opening of said hole and in flush contact with each surface of said plate,

(c) applying a force to a first of said conductive materials to force said first conductive material into contact with a second of said conductive materials where said force is of magnitude and character to produce a metallurgical junction between said conductive materials and form a hole through said conductive materials in the zone of contact, said metallurgical junction formed by vibrating at least that portion of said conductive materials in the zone of contact to cause said conductive materials metallurgically to bond at point of said contact.

33. Apparatus for forcing together selected areas of conduction members disposed on opposite sides of an insulating member through a hole in the insulating member to form a cold weld junction between said conduction members, comprising in combination:

(a) a first plate and second opposed plate,

(b) a plurality of opposed projecting members extending from the surface of said first plate and said second plate,

(c) an opposed convexly rounded face on each of said projecting members,

(d) means for positioning said insulating member between said first and second plates to align said areas of said conduction members to be welded with said projecting member, and

(e) means for driving said first and said second plates together to compress said conduction members together between said faces of said projecting members with sufficient force to form a cold weld junction between said conduction members in the zone of said hole.

4,319,709

POSITIONING OF AN ADDITIONAL TUBULAR ELEMENT ON A TUBULAR STRUCTURE

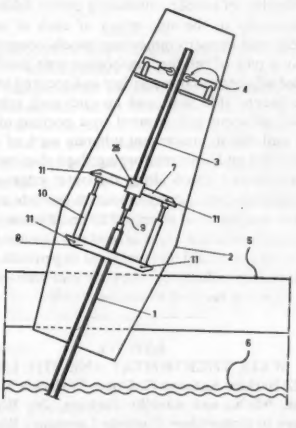
Michel J. Jegousse, Nantes, and Bruno J. M. De Sivry, Neuilly, both of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed Nov. 29, 1979, Ser. No. 98,443

Claims priority, application France, Nov. 29, 1978, 78 33660

Int. Cl.³ B23K *28/02*

U.S. Cl. 228—213 **10 Claims**



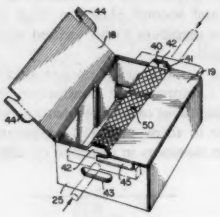
1. A method of positioning an additional tubular element on a tubular structure subject to random movement, the planes of the confronting end surfaces of the ends of said structure and of said additional element having slight angular deviations with reference to each other and to the corresponding theoretical planes orthogonal to the respective longitudinal axes of said structure and of said additional element, said method comprising bringing said additional element to a position in which it is substantially coaxial relative to said end of said structure and in which said end surface thereof is in contact with said end surface of said structure, contact there between occurring at the closest points of said end surfaces, exerting a compressive force across said contacting end surfaces adjacent said end surfaces, and simultaneously centering said end surfaces relative one to another from the interior of said structure and said additional element and laterally guiding said additional element, such that said additional element inclines relative to said structure to completely apply said end surface thereof against said end surface of said structure.

4,319,710

REINFORCED END SEALED CONTAINER

Edward L. Osborne, Kansas City, Kans., assignor to Westvaco Corporation, New York, N.Y.

Filed May 1, 1980, Ser. No. 145,866
Int. Cl.³ B65D 5/26, 5/24
U.S. Cl. 229—33 4 Claims



1. A reinforced end seal container prepared from a single blank of paperboard comprising:

(a) a substantially centrally located quadrilateral bottom panel with foldably attached side and end walls connected to the edges thereof;

(b) a pair of top closure flaps foldably attached to the outer edges of said side wall panels, said top closure flaps including integral end seal flaps foldably attached along the side edges thereof; and,

(c) a plurality of corner connecting panels foldably attached respectively to the side edges of each of said end wall panels, said corner connecting panels comprising respectively a pair of reinforcing/corner post panels which are folded adjacent to one another and secured to a portion of an adjacent side wall and an end wall reinforcing flap folded adjacent and secured to a portion of an adjacent end wall, the improvement wherein each of said end wall panels and end wall reinforcing flaps also include integral tab elements located along the outer edges thereof, said tab elements being coterminous to provide reinforcement for one another and arranged to lie adjacent to and cooperate with notched areas in said top closure flaps located in the region of said end seal flaps to provide a reinforcing compression column between the end walls when the end seal flaps are secured to the end walls.

4,319,711

WALL THERMOSTAT AND THE LIKE

Charles E. Barker; Anthony C. Cairo; Frederick T. Bauer, all of Holland, Mich., and Auzville Jackson, Jr., Richmond, Va., assignors to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 840,582, Oct. 11, 1977, abandoned.
This application Jan. 30, 1980, Ser. No. 116,959
Int. Cl.³ F23N 5/20
U.S. Cl. 236—46 R 6 Claims

1. A thermostat for an ambient air temperature regulation system comprising:

a microcomputer having:

an accumulator,

input/output channels coupled to said accumulator,

a data address register coupled to said accumulator,

an instruction decoder connected to said data address register,

conditional interrupt lines connected to said instruction decoder,

a multiplexer coupled to said data address register and to said instruction decoder,

discrete input/output ports connected to said multiplexer,

an arithmetic logic unit coupled to said accumulator,

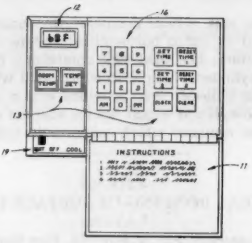
a carry flip flop connected to said accumulator and to said arithmetic logic unit,

a random access memory module connected to said accumulator and to said data address register,

a read only memory module connected to said instruction decoder,

a program counter connected to said read only memory module and to said instruction decoder,

a keyboard having a plurality of selector keys for providing manual inputs coupled to some of said input/output channels and to said discrete input/output ports,



a temperature sensor connected to at least one of said conditional interrupt lines,

a high frequency clock connected to at least one of said conditional interrupt lines,

an electronic display coupled to said discrete input/output ports and to some of said input/output channels, and

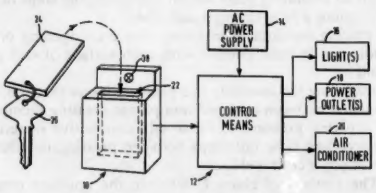
a remotely located thermal pump connected to said multiplexer for activation and deactivation by said microcomputer.

4,319,712

ENERGY UTILIZATION REDUCTION DEVICES

Ofer Bar, 12 Nordau St., Ashdod, Israel

Filed Apr. 28, 1980, Ser. No. 144,551
Int. Cl.³ G05D 23/00; F25D 17/00
U.S. Cl. 236—47 7 Claims

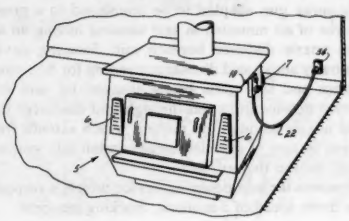


1. An energy conservation arrangement for a room lockable by means of a key, the arrangement comprising key reception means located or capable of being located in said room and capable of receiving said key or a tag of the key, said key reception means being operative to indicate whether or not said key or tag is received thereby, and control means responsive to said indication provided by said key reception means to fully enable operation of power-consuming equipment in said room when said key or tag is received by said key reception means and to limit the operation of said equipment when said key reception means, said control means being also operative, when said key or tag is not received by said key reception means, to control an air conditioner so that it can operate in a minimum power consumption mode and to by-pass a manual control means enabling selection of the speed of a blower of said air conditioner and to enable said blower to operate at its lower or lowest speed.

4,319,713
STOVE BLOWER CONTROL ACCESSORY

Roy D. Baker, Brooklyn, Mich., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Jan. 5, 1981, Ser. No. 222,569
Int. Cl.³ F24H *3/10*
U.S. Cl. 236—96 **5 Claims**



1. A thermostatic control for an electric blower that circulates air heated by a stove, said control including,

a housing mounting thermostatic means having a temperature receiving face which is positioned outwardly of said housing,

said housing also mounting a rheostat for controlling the blower speed, an electric socket for receiving an electric plug from the blower, and circuit means including said thermostatic means and said plug for establishing an electrical circuit between the blower plug and an external source of power when the temperature receiving face of said thermostatic means senses a temperature above a predetermined minimum,

said control also including spacing means which in use is positioned between said housing and a heated surface of said stove, thereby to separate the housing from the stove surface and to provide an air space between the stove surface and the housing,

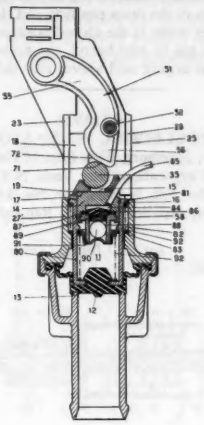
said spacing means spacing the housing from the stove so that the temperature receiving face of the thermostatic means is in thermal engagement with said heated surface of said stove.

4,319,714
DEVICE FOR SETTING A VALVE

Jean-Louis Moulene, Elancourt, and Jean-Francois Bouvot, Le Mesnil-Saint-Denis, both of France, assignors to Societe Anonyme Francaise Du Ferodo, Paris, France

Continuation of Ser. No. 10,706, Feb. 9, 1979, abandoned. This application Sep. 15, 1980, Ser. No. 187,015
Claims priority, application France, Feb. 17, 1978, 78 04631
Int. Cl.³ G05D *23/12*
U.S. Cl. 236—99 G **9 Claims**

8. A device for setting a valve having a movable assembly carrying the closure member of the valve and being slidable under the action of a lever having a ramp acting on a thrust member of the assembly to control closure and opening of the valve, said device including adjustment means, having a part which is accessible from the exterior of the valve, interposed between the thrust member and the ramp of the lever to slide together with the thrust member under the action of the lever for changing, in the closed position of the valve and in response to adjustment of said accessible part, the distance between the ramp and the thrust member so that after adjustment of said distance at a desired value, the valve can be opened and closed at will under the action of said lever without said distance being modified, the adjustment means comprising a cam which is circular and mounted for rotation around an axis offset with respect to the axis of the cam, the valve body having a through hole formed therein, the adjustment means being in registry therewith at least when it is actuated by the control lever to its maximum closed position, said adjustment means further comprising two journals cooperating with bearings of a drum or cradel and at least one knob coaxial with the journals defining said accessible part to permit rotation of the

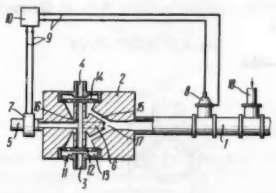


cam with a screw-driver or the like inserted through the hole in said body, and said knob comprising ratchet teeth and the drum including a pawl cooperating with the teeth.

4,319,715
APPARATUS FOR EXPLOSIVE APPLICATION OF COATINGS TO ARTICLES

Alexandr P. Garda, ulitsa Yanvarskogo vosstania, 24a, kv. 54; Oleg A. Andruschak, ulitsa Semashko, 12, kv. 107; Alexei P. Epik, ulitsa Gorkogo, 9, kv. 19; Sergei A. Kozlov, ulitsa Korotchenko, 25a, kv. 29; Evgeny F. Grechishkin, ulitsa Chelyabinskaya, 9, kv. 131; Georgy A. Voronin, prospekt 40 Letia Oktyabrya, 94/2, kv. 44; Viktor N. Krendelev, ulitsa Orlovskaya, 19, kv. 1, all of Kiev, U.S.S.R.; Grigory V. Samsonova, deceased, late of Kiev, U.S.S.R.; by Nadezhda A. Samsonova, administrator; by Natalya G. Samsonova, administrator, both of ulitsa, 51/53, kv. 43, Kiev, U.S.S.R., and by Evgeny G. Samsonova, administrator, Moscow, U.S.S.R.

Continuation of Ser. No. 862,339, Dec. 20, 1977, Pat. No. 4,215,819. This application Feb. 12, 1980, Ser. No. 120,890
Int. Cl.³ B05B *1/24, 17/00*
U.S. Cl. 239—81 **1 Claim**



1. An apparatus for explosive application of powder coatings to an article comprising: a barrel through which said powder is fed to said article; sources of purging gas and fuel gases under pressure having outlet pipes for feeding said gases to said barrel, the pressure of said purging gas source exceeding the pressure of each of said fuel gas sources; a gas distribution unit having a fuel gas mixing chamber arranged in an entrance opening of said barrel and connecting said outlet pipes to said barrel, outlet openings of said outlet pipes being arranged within said gas distribution unit, a passage connecting the outlet opening of said purging gas outlet pipe and said outlet

openings of said fuel gas outlet pipes; and valves mounted between the outlet openings of said fuel gas outlet pipes and said mixing chamber, said valves admitting said fuel gases to said barrel when in the open position and shutting-off the flow of said fuel gases when in the closed position during the admission of purging gas to said barrel, the pressure of the flow of said purging gas urging said valves into said closed position.

4,319,716

PIEZOELECTRIC FLUID ATOMIZER

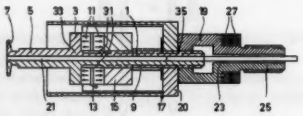
Reinhard Lauer, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1980, Ser. No. 119,910

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1979, 2904861

Int. Cl.³ B05B *17/06*

U.S. Cl. 239—102 **8 Claims**



1. A piezoelectric fluid atomizer comprising:

a bolt having first and second ends, the first end forming an abutment plate, a cylindrical extension from the abutment plate, and an oscillating plate on the end of the cylindrical extension remote from the abutment plate;

a pressure plate secured to the bolt near its second end;

a ring-shaped piezoceramic converter element slidably mounted on the bolt and compressed between the abutment plate and the pressure plate; and

a shield, secured to the bolt between the pressure plate and the second end of the bolt, said shield enclosing the converter element;

wherein when a suitable alternating voltage is applied to the piezoceramic converter element, the oscillating plate oscillates and oscillation nodes are present at the abutment plate and at the location where the shield is secured to the bolt.

4,319,717

SPRAY GUN FOR APPLYING GRANULATED MATERIAL

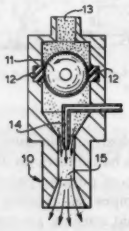
Frank Hofmann, Hamburg, Fed. Rep. of Germany, assignor to Firma Walter Hofmann, Fed. Rep. of Germany

Filed Jan. 25, 1980, Ser. No. 115,316

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1979, 7902264

Int. Cl.³ E01C *23/16*

U.S. Cl. 239—654 **8 Claims**



1. An apparatus for applying glass beads onto roadway markings, comprising:

a housing having an upper feed opening adapted to be connected to a source of glass beads and a discharge conduit including a generally funnel-shaped upper section, a relatively narrow intermediate section and a lower, downwardly-directed, outwardly-flared nozzle-shaped section having a downwardly-directed discharge opening;

a dosaging device mounted in said housing for dosaging glass beads to be applied to roadway markings in a defined amount per surface area to be covered;

an air spray gun adapted to be connected to a pressurized source of air mounted in said housing having an air ejection nozzle disposed beneath said dosaging device and centrally above said discharge opening for directing an air stream and said glass beads dosaged by said dosaging device downwardly and through said discharge opening, said nozzle having a tip portion which extends from said upper section of said discharge conduit into said intermediate section thereof; and

drive means for said dosaging device which is responsive to the drive speed of a roadway marking machine.

4,319,718

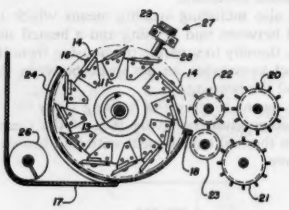
FORAGE HARVESTER CUTTERHEAD AND METHOD OF SHARPENING

Benjamin H. Snavely, New Holland, and Henry N. Lausch, Denver, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Dec. 6, 1977, Ser. No. 857,954

Int. Cl.³ B02C *18/06*

U.S. Cl. 241—101.2 **10 Claims**



1. A forage harvester for cutting forage material comprising:

(a) a housing including a front wall terminating in a forward inlet for receiving forage material and a back wall having an outlet for discharging cut forage material;

(b) at least two rotatable infeed rolls mounted adjacent said inlet cooperatively arranged to feed the forage material into said inlet along a predetermined path;

(c) a shear bar adjacent said inlet below said predetermined path, said shear bar being selectively laterally adjustable toward and away from said inlet;

(d) a rotary cylindrical cutterhead mounted for rotation about its axis in said housing, said cutterhead having a plurality of elongate cutter knives affixed to the periphery thereof and movable therewith in a cylindrical cutting path in coacting cutting relation with said shear bar, each said cutter knife having substantially an isosceles trapezoidal lateral cross sectional configuration with the shorter base closer to the longitudinal axis of the cutterhead and cutting edges formed by the sides and longer base thereof; and

(e) a sharpening means mounted adjacent said cylindrical cutting path and selectively movable into and away therefrom to engage said cutter knives and positioned to remove a portion of each to form a new cutting edge on each knife on one side thereof closer to the shorter base than the previous cutting edge.

4,319,719

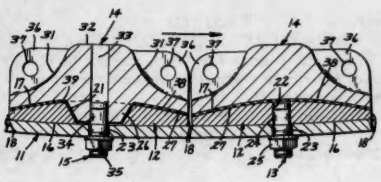
SHELL LINER ASSEMBLY FOR ORE GRINDING MILLS

Darrell R. Larsen, Salt Lake City, Utah, assignor to Minneapolis Electric Steel Castings Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 79,382, Sep. 27, 1979, Pat. No. 4,270,705, which is a continuation-in-part of Ser. No. 932,711, Aug. 11, 1978, Pat. No. 4,235,386. This application Jan. 28, 1980, Ser. No. 115,940

Int. Cl.[3] B02C 17/22

U.S. Cl. 241—183 17 Claims



1. A liner assembly for the cylindrical shell of an ore grinding machine comprising:

(a) a plurality of first liner segments of predetermined size and configuration, each defining a bottom mounting surface constructed for mounting engagement with the inner surface of the cylindrical shall, and each of said first liner segments further defining a top mounting surface;

(b) said first liner segments being disposed in close proximity to each other with minimum space therebetween so that said plurality of first liner segments covers virtually the entirety of said cylindrical shell;

(c) a plurality of second liner segments of predetermined size and configuration, each of said second liner segments defining a bottom mounting surface constructed for mounting engagement with the top mounting surface of an associated first liner segment, each second liner segment further defining a top grinding surface for comminuting ore;

(d) said second liner segments being disposed in close proximity to each other with minimum space therebetween, and being sized relative to the first liner segments so that, in assembled relation, the first liner segments are substantially covered by the second liner segments and virtually unexposed to the ore comminution process to prevent the first liner segments from becoming worn;

(e) first connecting means for releasably mounting a portion of the first liner segments to the cylindrical shell independently of the second liner segments;

(f) and second connecting means for releasably mounting each of the second liner segments on an associated one of said first liner segments to permit removal thereof without removing the associated first liner segments from the cylindrical shell;

(g) the first and second liner segments being so constructed that the second liner segments completely and protectively cover the first connecting means with the liner assembly in assembled relation.

4,319,720

YARN KNOTTING OPERATION CONTROL APPARATUS IN AUTOMATIC WINDER

Yutaka Ueda, Naraken, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan

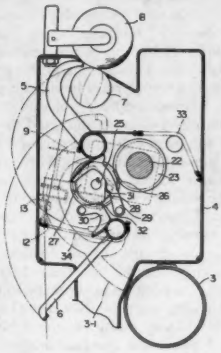
Filed Jul. 25, 1980, Ser. No. 172,383

Claims priority, application Japan, Jul. 17, 1979, 54-96432[U]

Int. Cl.[3] B65H 54/20, 54/22, 63/00

U.S. Cl. 242—35.5 R 9 Claims

1. A yarn knotting operation control apparatus in an automatic winder having a plurality of winding units arranged in parallel including one air conduit which is used in common for performing the yarn knotting operation to the respective winding units, one blower connected to the air conduit, the capacity of said blower being adjusted so that the blowing capacity is smaller than the blowing capacity capable of performing the normal yarn knotting operation when all the winding units use the suction air streams simultaneously, devices for detecting whether or not the normal travel of yarns is performed in the respective winding units, devices for initiating the yarn knotting operation on receipt of instruction signals of the yarn knotting operation, and a control device comprising a memory storage for storing signals from the detecting devices of the respective winding units and means for putting out signals of the yarn knotting operation to the yarn knotting operation-initiating devices in an order predetermined with respect to the capacity of the blower.



4,319,721

SAFETY BELT RETRACTOR

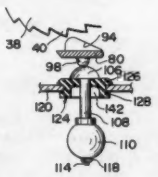
Takuro Kawai, Kosai, and Mitsuru Kato, Toyohashi, both of Japan, assignors to Fuji Kiko Kabushiki Kaisha, Japan

Filed Dec. 6, 1979, Ser. No. 101,006

Claims priority, application Japan, Dec. 6, 1978, 53-168333[U]; Oct. 18, 1979, 54-144186[U]

Int. Cl.[3] A62B 35/02; B65H 75/48

U.S. Cl. 242—107.4 A 13 Claims



1. An improved vehicle safety-belt retractor, for protecting a wearer from danger caused when the vehicle is suddenly or rapidly decelerated, of the type having a frame, a belt reel rotatably mounted within the frame, a safety-belt wound on the belt reel, the belt reel being rotatable in a first direction to wind the belt on the reel for retraction of the belt and rotatable in a second direction to unwind the belt for extraction of the belt from the frame, a ratchet wheel with a plurality of ratchet teeth on the periphery thereof being secured on said belt reel, a locking member movably mounted within said frame adjacent to said ratchet wheel for engagement with the teeth of said ratchet wheel to thereby define a locked position in which rotation of the reel in the second direction is prevented and an inertia sensing means including means for moving the locking

member for engagement of the locking member and the ratchet wheel to prevent extraction responsive to a sudden or rapid deceleration of the vehicle,

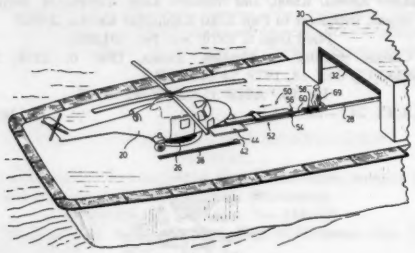
the improvement, in combination, comprising a pendulum member having a substantially rigid stem extending upwardly therefrom and a head portion, supporting means for pivotally supporting the pendulum member for pivotal movement about a pivot axis, said supporting means including a supporting plate laterally positioned within the frame, said plate having an opening therein, and an elastic member mounted to said supporting plate, said elastic member having a first portion extending through said opening of said plate and a second portion overlying a part of said plate, said first portion having an opening located in alignment with said opening of said supporting plate, the pendulum member being mounted to said supporting means with said stem extending through said opening of said elastic support member and with said head portion mounted on said second portion to permit the displacement of said pendulum member in relation to said supporting plate and the accumulation of the reaction energy of the locking member in said elastic member imparted to said elastic member through the inertia sensing means when the locking member is deflected by a tooth of the ratchet wheel to a position apart therefrom for elastically forcing the locking member toward the ratchet wheel for interengagement, said elastic member having sufficient hardness to support the locking member in the locked position and sufficient elasticity to accumulate the reaction energy of the locking member upon deflection thereof from the ratchet wheel.

4,319,722

TRAVERSER AND COMPONENTS THEREFOR

Mario Pesando, 3570 Hawkestone Rd., Mississauga, Ontario, Canada

Filed May 7, 1979, Ser. No. 36,850
Int. Cl.³ B64F *1/22, 1/12*
U.S. Cl. 244—116 **19 Claims**



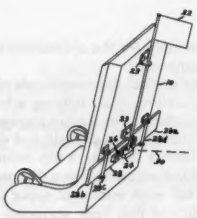
1. A traversing system for traversing a Sea Lynx Helicopter having laterally spaced wheel units, a nose wheel and a harpoon for securing to a grid system mounted on the deck of a ship, from its landing position to a storage position into a hanger on the ship, which ship includes a grid system used to secure the Sea Lynx Helicopter to the deck of the ship, the traversing system comprising a traverser, means for securing the traverser to the ship deck and means for traversing the traverser on the ship deck to and from the hangar and a position proximate the landing position, control means for controlling the movement of the traverser, the traverser being relatively narrow and of a low profile for clearing the deck of the ship for positioning under the helicopter over the grid system without interfering with the grid system, the traverser comprising a relatively narrow base assembly and means to secure the nose wheel therein, the base secured to the means for traversing the traverser on the ship deck, a relatively long, relatively narrow cross-beam assembly pivotally secured to the base, pivotal from a position substantially parallel to the traverser base to a position at substantially 90° to the direction of movement of the base when securing the helicopter to the traverser, a carriage supported on the cross-beam assembly for movement therealong, control means for controlling the movement of the carriage, retaining means carried by the carriage for use to secure the harpoon of the helicopter including a pair of pivotally mounted struts for securing to the laterally spaced wheel units of the helicopter to triangulate the retaining means and harpoon connection for stabilizing the harpoon when secured to the retaining means.

4,319,723

STABILIZER FOR AN EJECTION SEAT

Edwin R. Schultz, Waynesville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 10, 1980, Ser. No. 111,044
Int. Cl.³ B64D *25/10*
U.S. Cl. 244—122 A **4 Claims**



1. A yaw stabilization system on an aircraft ejection seat, comprising:

a yaw stabilization paddle device supported on the back of the ejection seat for transverse movement relative to the opposite sides of the seat; and

means mounted on the back of the seat and extending above the back of the seat into the air stream for sensing the direction of yaw angular offset of the air flow velocity vector relative to the seat upon yaw rotation of the ejection seat and for causing transverse movement of said yaw stabilization paddle device into the air stream in the direction of yaw angular offset, to provide a restoring moment on the ejection seat.

4,319,724

LIGHTWEIGHT CABLE LADDER

Stanley A. Bradbury, London, England, assignor to Crouse-Hinds Company, Syracuse, N.Y.

Filed Nov. 28, 1979, Ser. No. 98,313
Int. Cl.³ F16L *3/00*
U.S. Cl. 248—49 **2 Claims**

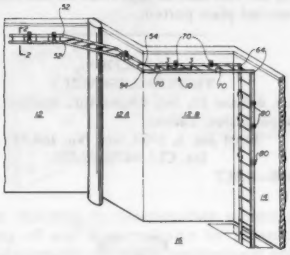
1. A ladder for cables or the like that are adapted to be positioned thereon by ties, said ladder comprising:

a pair of siderail members formed of a lightweight material, each having a first slot facing the other siderail member and a second slot substantially perpendicular to said first slot;

a rung member formed of a lightweight material and having its end portions disposed in said first slots, said rung member having opposite side edges that are serrated to provide a non-slip anchorage for ties positioning the cables on the ladder;

a connecting plate being receivable in said second slots of adjacent siderail members to connect them together, said connecting plate being formed of a bendable material and having notches in the opposite edge portions thereof defining a bend line therein, said connecting plate com-

prising end portions disposed at an angle to each other substantially along said bend line, and



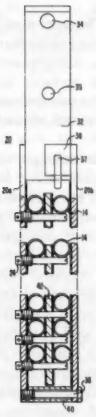
a hanger adapted to support a siderail member and to be connected to a support surface, said hanger being adapted to be snap-fitted over a siderail member.

4,319,725

APPARATUS FOR VERTICALLY TUBING A HEAT EXCHANGER

Robert E. Meuschke, and Walter J. Vandriak, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 21, 1980, Ser. No. 132,567
Int. Cl.³ F16L *3/22*
U.S. Cl. 248—68 R **7 Claims**



1. A frame-like structure for verticaly supporting a plurality of U-bend heat exchanger tubes including a vertical arm member for clamping the tubes therein at generally the midpoint of the U-bend portion thereof comprising:

a pair of spaced opposed vertically extending members;

upper spacer means adjacent the upper end of said members to provide a predetermined horizontal spatial separation therebetween;

a removable spacer means adjacent the lower end of said members to provide a like predetermined spatial separation therebetween at the lower end;

a vertical row of horizontal support pins removably received in at least one of said members and extending into said spatial separation a distance sufficient to supportingly engage a tube projecting transversely between said members; and

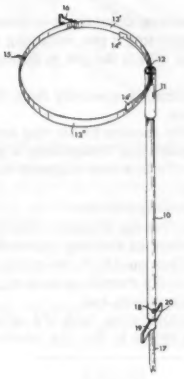
a plurality of vertically spaced horizontally projecting interconnecting means for drawing said vertically extending members together a distance to clamp the tubes supported therebetween with a predetermined clamping force.

4,319,726

COMBINED SACK HOLDER AND WEED REMOVAL IRON

Gustav V. Andersson, Ejdervägen 28, Saltsjö-Duvnäs, Sweden (133 00)

Filed Dec. 14, 1976, Ser. No. 750,398
Int. Cl.³ B65B *67/12*
U.S. Cl. 248—97 **2 Claims**



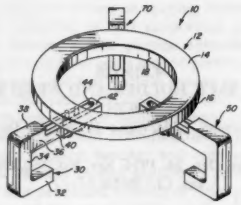
1. A combined sack holder and weed removal device, said device comprising an elongate bar member, a ring supported at the upper end of the bar member for holding a sack for collecting waste material and the like, said bar member including a groove at the upper end thereof in which said ring is received, and said ring comprising first and second parts which overlap one another within the width of the groove and for a small additional distance on each side of the groove, said first and second parts comprising a longer part and a shorter part, an outwardly directed point on said longer part at a location opposite to the groove of the bar member and means for connecting said first and second ring parts together so as to enable variation in the circumference of the ring to thereby accommodate sacks of different sized openings, said connecting means comprising a clamping device for bounding said parts together at the ends thereof opposite ends which overlap so as to enable the circumference of the ring to be made greater or smaller, said bar member being of tubular form at the lower end thereof and said device further comprising an elongate removable weed removal member detachably received at one end thereof in the lower end of the bar member, said weed removal member including a bifurcated weed removal tool at the other end thereof and at least one step affixed to said weed removal member intermediate the ends thereof for enabling pressing of the weed removal tool into the earth, said tubular form lower end of said bar member including a hole extending therethrough and said device further comprising a locking pin removably received in said hole for holding said weed removal tool in place in said lower end of said bar member and for permitting removal and replacement of said weed removal tool.

4,319,727

EXPANDABLE POT HOLDER APPARATUS

Joan H. Rattay, 749 E. Maryland Ave., Phoenix, Ariz. 85014

Filed Jan. 17, 1980, Ser. No. 117,191
Int. Cl.[3] A47G 23/02
U.S. Cl. 248—149 7 Claims



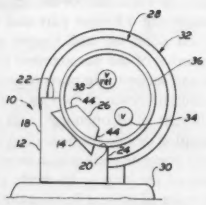
1. Pot holder apparatus, comprising in combination:
ring means for supporting a pot, including a ring having an upper surface on which the pot is disposed, and a lower surface;
aperture means extending upwardly from the lower surface of the ring means;
leg means adjustably secured to the ring means for supporting the ring means and comprising a plurality of base supports, each of which base supports includes
a lower portion,
a vertically extending portion,
an upper portion having an upper surface co-planar with the upper surface of the ring means for providing an additional surface on which the pot is disposed, and
an upper horizontally extending support portion disposed against the ring means; and
fastening means cooperating with the aperture means for securing the leg means to the ring means.

4,319,728

LIQUIFIED GAS CYLINDER ANTI-ROTATION DEVICE

William V. Pataki, and O. Raymond Smay, both of Newburgh, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 14, 1980, Ser. No. 140,018
Int. Cl.[3] A47G 23/02
U.S. Cl. 248—154 3 Claims



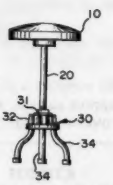
1. In combination with clamping means for attaching a cylindrical fuel tank having a neck ring on it with a rectangular opening therein to a platform on a vehicle, a device for preventing rotation of the tank about its longitudinal axis and limiting longitudinal movement of said tank, comprising:
a bracket having a first plate portion adapted for attachment to said platform and a second plate portion projecting upward from said first plate portion and having a generally upwardly facing concave edge thereon for supporting the neck ring on said tank; and
a flat blade attached to the second plate portion of said bracket and projecting generally upwardly from said concave edge, said blade diverging toward said concave edge for wedging of the blade in the opening in the neck ring of the fuel tank as supported on the concave edge of said second plate portion.

4,319,729

TRIPOD ASSEMBLY

Jau-Lin Lo, 6 Lane 10, Szu Chuan Rd., Section 1, Pan Chiao City, Taipai Hsien, Taiwan

Filed Jul. 3, 1980, Ser. No. 165,417
Int. Cl.[3] A47B 91/00
U.S. Cl. 248—188.7 5 Claims



1. A tripod assembly comprising:
joint means in the general configuration of a bell housing, with an open bottom and means defining a central opening through the top thereof, the inner wall thereof being provided with a plurality of outwardly projecting, equispaced, upwardly tapering surfaces having a predetermined configuration;
nut means shaped to be accommodated within said joint means in nested, mating non-rotational relationship therewith, said nut means being provided with a plurality of equispaced, recessed surfaces thereabout, said recessed surfaces also having a predetermined configuration, said nut means having a central, threaded hole extending vertically therethrough;
screw means insertable through said joint means opening and having a threaded outer surface mating with the threaded hole in said nut means; and
a plurality of curved, supporting legs each having an upper end having an external configuration mating with the internal configuration of the inner tapered surfaces of said joint means and the recessed surfaces of said nut means, said surfaces thus defining chambers having substantial surface areas, whereupon insertion of said leg upper ends into their respective said chambers and threading of said screw means through said joint means opening, into said nut means, said nut means is caused to withdraw into said joint means and tightly embed said leg means ends within their respective said chambers, due to the substantial surface area, face to face contact of said chambers with said leg upper ends to thereby form a rigid, unitary tripod structure.

4,319,730

SELF-LOCKING MERCHANDISE HOOK

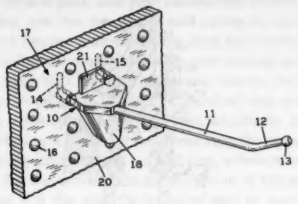
David R. Thalenfeld, Beachurst, N.Y., assignor to Trion Industries Inc., Garden City, N.Y.

Filed Feb. 1, 1980, Ser. No. 117,459
Int. Cl.[3] E04G 5/06; F16L 3/08
U.S. Cl. 248—220.4 7 Claims

1. In a merchandise display device of the type having a base member, panel engaging lugs extending rearwardly and upward from the upper back edge area of said base member, and merchandise support means extending forwardly from said base member, the improvement which comprises
(a) a resilient, flexible locking tongue mounted in fixed relation to said base member and extending upwardly from

the upper back edge of said base member and adapted to overlie the front surface of a perforated panel board,

(b) said locking tongue being resiliently deflectable in a



forward direction to accommodate mounting and demounting of said display device by forward flexation while substantially preventing unintentional dislodgement of the display device from a panel board.

4,319,731

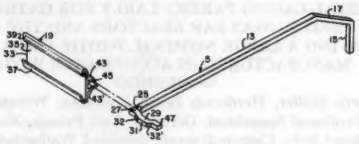
MERCHANDISE DISPLAY ASSEMBLY

William Pfeifer, Springdale, Pa., assignor to Armstrong Store Fixture Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 55,828, Jul. 9, 1979. This application Nov. 10, 1980, Ser. No. 205,654

Int. Cl.³ G09F *3/18*

U.S. Cl. 248—223.4 **6 Claims**



1. In an information display assembly of the type including a cantilevered arm and a means for displaying indicia at the free end of the cantilevered arm, the improvement wherein the cantilevered arm comprises: a shaft with at least one transverse groove near the free end of the shaft, and a horizontal member extending at a right angle from the free end of the shaft, parallel with said groove and wherein the means for displaying indicia is removably attached to said shaft and comprises: a planar member having a front face upon which indicia is displayed, a rear face and upper and lower resilient, planar, generally rectangular arms extending transversely from the rear face in generally parallel spaced relationship with a flange at the free end of at least one of the said arms extending toward the other arm, said arms, flange and groove being so dimensioned that when the display means is attached to the cantilevered arm with said planar member generally perpendicular to the axis of said shaft, said upper and lower arms straddle said horizontal member and the shaft, and said flange engages said transverse groove in said shaft with a friction fit and overlaps said horizontal member to secure said display means against rotation about the axis of the cantilevered arm and the axis of the horizontal member and against rotation in the plane containing the cantilevered arm and the horizontal member.

4,319,732

LOAD CARRYING PLATFORMS

Roger D. Godfrey, Brighton, England, assignor to Flashstar Limited, Newhaven, England

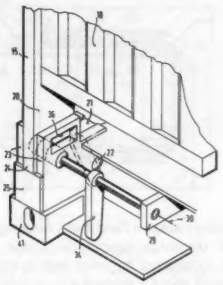
Filed Oct. 30, 1979, Ser. No. 89,460

Claims priority, application United Kingdom, Oct. 31, 1978, 42642/78

Int. Cl.³ B65D *19/12*

U.S. Cl. 248—346 **9 Claims**

1. A load carrying platform comprising a base having a pair of opposed ends, and end members pivotally mounted on the base at each of said ends, the end members comprising at least a pair of corner posts at respective corners of each said opposed ends, each said corner being provided with a mounting means for the associated corner post, the mounting means including a pair of rigid elements between which is mounted a pivot, the corner post being pivotally mounted at said pivot and the pivot being spaced inwardly of the corner of the base whereby the corner post is pivotable between an upright condition, in which it is disposed upright between the rigid elements of the mounting means at the corner, and a collapsed



condition, in which it lies generally parallel and closely adjacent to the base and partly exposing the rigid elements of the mounting means, each of the rigid elements and the corner post having an opening, all of said openings being generally aligned when the post is in the upright condition, and a locking member being provided engageable with said openings and having a cam surface acting on the opening of at least the corner post, the locking member being rotatable to force the cam surface into firm locking engagement with the opening of the corner post to lock the corner post in the upright condition.

4,319,733

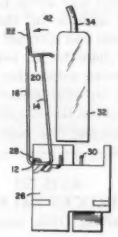
LOCKING SPRING CLIP

Nabil S. Hanna, Harrisburg, and John R. Shuey, Carlisle, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 22, 1980, Ser. No. 114,450

Int. Cl.³ H01R *13/62*

U.S. Cl. 248—507 **6 Claims**



1. A locking spring clip for securing electrical connector members together in a mated condition, said clip comprising:

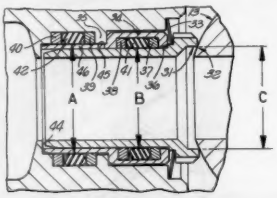
a base, first and second spaced arms extending from opposite sides of said base in cantilever fashion, said first arm having a latching lug extending therefrom in a direction away from said second arm and a stepped shoulder directed towards said first arm, said second arm having a length slightly greater than the length from the base to said shoulder whereby in a latched condition said lug engages a rear surface of a mated connector member and said second arm is positioned beneath said shoulder under

compression to prevent the unintended disengagement of said lug.

4,319,734
VALVE

Ali Acar, Los Angeles, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 9, 1981, Ser. No. 241,724
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—174 **1 Claim**



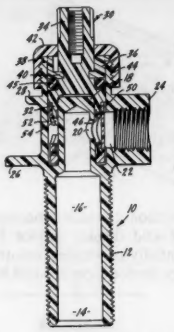
1. A valve comprising: a fluid tight housing having first and second aligned openings concentric about a first axis, and means defining a chamber between said openings; a ball valve rotatably mounted about a second axis in said chamber normal to said first axis, said ball valve having a cylindrical hole therethrough with a third axis rotatable therewith to a postion in alignment with said first axis and normal to said second axis; a cylinder having an annular lip with a sharp edge with an inside diameter, said cylinder having a main external cylindrical surface smaller than said lip inside diameter, said housing having seal means to guide axial movement of said cylinder toward and away from said ball valve coaxial with said first axis; and spring means to urge said lip, at said inside diameter thereof, into fluid tight contact with said ball valve around said hole therethrough, said seal means including a sleeve around said cylinder and having an internal first groove adjacent said lip; a first annular seal in said internal first groove in compression in between said sleeve and said cylinder, said seal means having a cylindrical portion contiguous to said housing, said housing forming an annular second groove with said cylindrical portion; and a second annular seal in compression in said second groove between said cylindrical portion and said housing, said housing having a bore to receive said cyinder and including spring biasing means between said bore and said cylinder to bias said sharp edge into compression against said ball valve, wherein said ball valve has a spherical surface in engagment with said annular lip sharp edge, said lip being formed between internal and external surfaces, said annular lip sharp edge having a diameter C, said cylinder main outside cylindrical surface having a diameter B, said seal means cylindrical portion having an outside diameter A, A being larger than C, C being larger than B to thereby cause self sealing with flow in either direction and in a zero flow condition.

4,319,735
FAUCET VALVES

Alfred M. Moen, Grafton, Ohio, assignor to Stanadyne, Inc., Windsor, Conn.

Filed Jul. 22, 1980, Ser. No. 171,130
Int. Cl.³ F16K *5/04, 5/18*
U.S. Cl. 251—175 **13 Claims**

1. A valve structure including a sleeve having an inlet and an outlet and a flow path therebetween, a rotatable valve member positioned within said sleeve and having a portion movable in surrounding relation about said inlet and between said inlet and outlet, said valve member portion having an opening therein movable to a position within said flow path and adjacent said sleeve outlet to connect said sleeve inlet and outlet, and seal means carried on the inside of said valve member portion and spaced circumferentially from said opening, said seal means being rotatable about said inlet to a position adjacent said outlet and downstream of said inlet closing communication between said sleeve inlet and outlet, with pressure from said inlet being directed against said seal urging it into closing

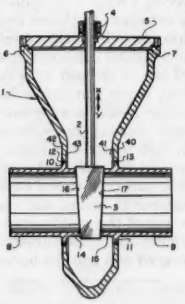


position only when said seal is in substantial register with said outlet, said path of flow never being through said seal means at any position of said movable valve member.

4,319,736
APPARATUS AND METHOD FOR MANUFACTURING A METAL CASING PARTICULARLY FOR GATE VALVES USED IN NUCLEAR REACTORS AND THE LIKE, HAVING A LARGE NOMINAL WIDTH AND A CASING MANUFACTURED IN ACCORDANCE WITH THE METHOD

Erwin Müller, Herdecke; Bernd Kollmann, Witten-Stockum; Ferdinand Sonnabend, Dortmud; Gert Petzolt, Nordkirchen; Josef Balz, Castrop-Rauxel; Bernhard Walloschek, Witten-Stockum, and Friedrich Risse, Bochum-Querenburg, all of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Oct. 25, 1979, Ser. No. 87,950
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847579
Int. Cl.³ F16K *27/10*
U.S. Cl. 251—329 **4 Claims**



1. A forged metal casing, particularly for accessories which can be employed in installations requiring high safety measures, and having a large nominal width over 300 mm and particularly a casing for a gate valve, comprising, a one-piece casing body having an open cylindrical end portion, a fructo conical intermediate portion extending from said cylindrical end portion and a planar wall portion extending from said fructo conical portion, said planar wall portion having at least a pair of opposite planar walls having planar interior and exte-

rior surfaces, at least one of said walls having a port therein, a pipe connection including a radially extending flange welded at one seam to said port, said pipe connection having a projection extending into the interior of said casing to form a valve seat, said port having a diameter less than the width of said at least one wall for leaving an approach area around said port for test heads to test said seam by ultrasonic waves, and a closing top member connected to said cylindrical end portion for hermetically closing said casing, said approach area being planar and having a width A for permitting the approach of a test head which equal 2 tan α x s+15 mm, where α is the angle of radiation for the test head in the direction of the at least one welded seam, s is the wall thickness of said at least one wall portion.

4,319,737

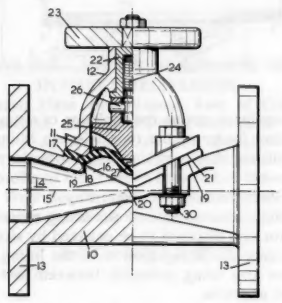
DIAPHRAM VALVE

Timothy O. W. Waterfield, Chandler's Ford, England, assignor to Waterfield Engineering Limited, Hampshire, England

Continuation of Ser. No. 900,393, Apr. 26, 1978, abandoned. This application Dec. 12, 1979, Ser. No. 102,813

Int. Cl.³ F16K *7/12*

U.S. Cl. 251—331 **11 Claims**



1. A diaphragm valve comprising a body traversed by a fluid passageway and having an opening in communication with the fluid passageway, a diaphragm for controlling fluid flow through the passageway and extending across the opening, a bonnet secured to the body by a plurality of bolts with the peripheral portion of the diaphragm clamped between the body and bonnet, and a mechanism carried by the bonnet and connected to the diaphragm for moving same between valve closed and valve opened positions, the body being provided around the opening with a diaphragm support face formed by two flat seating surfaces which are inclined relative to each other so as to be divergent in the direction toward said bonnet and which are joined together by curved surfaces to provide for self location of the diaphragm relative to the opening of the body when the bonnet and diaphragm are assembled onto the body with said mechanism in valve closed position, said flat surfaces forming a major part of the entire support surface area of said diaphragm support face, and the bonnet being provided with a diaphragm clamping face comprising two flat surfaces which are inclined relative to each other so as to converge at the bottom end of the bonnet, characterized by the bonnet being formed with a plurality of holes and the body having an equal plurality of complementary, open-sided cast lugs for receiving the bolts.

4,319,738

LIFTING MECHANISMS ESPECIALLY LIFTING PLATFORM

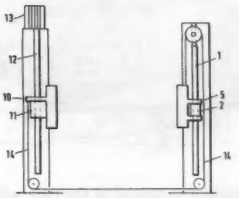
Hans Nussbaum, Bodersweier, Fed. Rep. of Germany, assignor to Otto Nussbaum G.m.b.H. & Co. KG, Fertigungstechnik und Maschinenbau, Kehl-Bodersweier, Fed. Rep. of Germany

Filed Mar. 7, 1980, Ser. No. 128,243

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1979, 2909171

Int. Cl.³ B66F *7/14*

U.S. Cl. 254—89 R **5 Claims**



1. A lifting mechanism comprising:

a lifting platform having at least one lifting column;

a threaded catch rod attached to said column; and

an easily workable nut mounted on said rod and guided by said platform for rotation and movement up and down with said platform,

a compressable spring between said platform and the top side of said nut,

said platform having a portion engaging said nut when said spring is compressed to thereafter prevent rotation of said nut and downward movement thereof in the event of rapid downward movement of said platform.

4,319,739

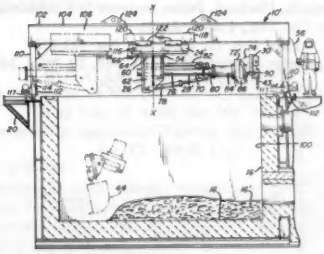
METALLURGICAL PROCESSING VESSEL

Lawrence Skendrovic, West Mifflin, Pa., assignor to William M. Bailey Company, Washington, Pa.

Division of Ser. No. 914,998, Jun. 13, 1978, Pat. No. 4,239,291. This application Apr. 28, 1980, Ser. No. 144,356

Int. Cl.³ C21B *7/04*; H05B *7/18*

U.S. Cl. 266—280 **5 Claims**



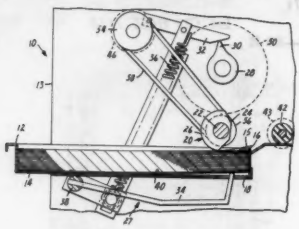
1. In a metallurgical process vessel having an upwardly open metallic outer shell with refractory disposed on all inner peripheral surfaces of said shell, the improvement comprising: refractory clean-out means positioned in the bottom of said vessel; and said clean-out means including an opening formed through said shell at the bottom location and frangible heat resistant material covering said opening and extending downwardly therefrom.

4,319,740

SHEET FEEDER

John W. Ulseth, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 23, 1980, Ser. No. 161,741
Int. Cl.³ B65H *3/30*
U.S. Cl. 271—22 **3 Claims**



1. A sheet feeding apparatus of the type utilizing a storage cassette for containing sheets, said cassette including sheet separating means for separating the uppermost sheet and a bottom side having an aperture through which the sheets are accessible, said apparatus comprising

frame means,

a generally cylindrical feed roller, mounted for rotation within said frame means, having a flat portion extending longitudinally thereon and being disposed such that upon rotation said flat portion is spaced above said sheet separating means, and the cylindrical portion of said feed roller extends beneath said sheet separating means,

lifting means disposed for lifting the sheets in said cassette until said sheets contact said sheet separating means,

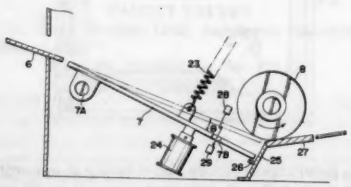
drive means for continuously rotating said feed roller and for periodically lifting said lifting means toward said sheet separating means only during a period of the rotation of said feed roller in which said flat portion is spaced above said sheet separating means, and for maintaining the sheets in this lifted state during a period of the rotation of said feed roller in which said cylindrical portion extends beneath said sheet separating means so as to afford frictional contact between said feed roller and the sheets being lifted, thereby feeding the uppermost sheet.

4,319,741

ORIGINAL PAY-OFF DEVICE FOR AN AUTOMATIC ORIGINAL FEED UNIT

Syuzi Okamoto, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1980, Ser. No. 122,713
Claims priority, application Japan, Feb. 20, 1979, 54/18769
Int. Cl.³ B65H *3/06*
U.S. Cl. 271—118 **3 Claims**



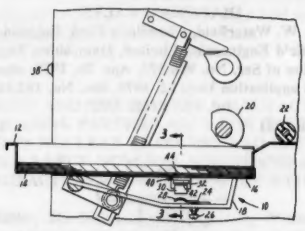
1. An original pay-off device comprising an original supplying tray for supporting a plurality of originals, a pivot about which said supplying tray is pivotally movable and upon which said supplying tray is supported on said device, said tray being pivotable between a lifted and a lowered position, means for pivotally moving said tray and comprising a solenoid and a spring; a driven pay-off roller for frictionally engaging the uppermost of said plurality of originals upon movement of said tray into said lifted position whereby said roller moves said originals in a forward direction, said device further comprising a stationary, resilient, yieldable separating member having a relatively high coefficient of friction in abutting engagement with said roller at a point forwardly of the location of said frictional engagement between said uppermost original and said roller, said separating member frictionally engaging the lower original of a pair of originals moved in said forward direction by said roller to thereby retard the advance of said lower original.

4,319,742

SHEET SUPPLY DETECTOR AND INDICATOR

John W. Ulseth, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 23, 1980, Ser. No. 161,733
Int. Cl.³ B65H *1/14, 3/06, 43/02*
U.S. Cl. 271—118 **6 Claims**



1. A device for detecting the depletion of a supply of sheets within a sheet feeder of the type wherein lifting means are utilized to lift the sheets within the sheet feeder away from a support member and toward a feed roller to afford the feeding of a single sheet; said device comprising

a connecting arm mounted on the lifting means,

an actuator arm disposed to be engaged by said connecting arm during the lifting motion of the lifting means, said actuator arm being pivotable between first and second relative positions,

indicator means for indicating the depletion of sheets within the sheet feeder, said indicator means being connected to said actuator arm such that the movement of said actuator arm from its first position to its second position activates said indicator means, and the movement of said actuator arm from its second position to its first position de-activates said indicator means,

means for magnetically latching said actuator arm at its second position upon said lifting means travelling a predetermined distance toward the feed roller.

4,319,743

TWO-DIRECTION ROTARY PAPER ALIGNER

Allan J. Rood, Longmont, Colo., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 11, 1980, Ser. No. 120,444
Int. Cl.³ B65H *29/22, 9/10, 29/32, 31/34*
U.S. Cl. 271—184 **16 Claims**

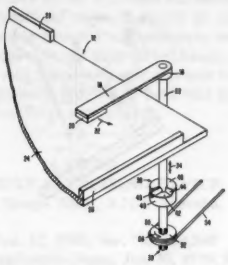
1. An apparatus for receiving sheets in seriatim, stacking the sheets into a vertical stack and aligning said sheets during formation of the stack, said apparatus comprising:

a stack support tray having at least one reference edge thereon and at least one entrance for receiving incoming sheets;

a paper aligner positioned relative to the support tray and operable to contact an incoming sheet pulling the sheet in

at least one direction substantially perpendicular to the reference edge;

a cam having a central opening with a camming surface positioned relative to the opening, said surface having a configuration for imparting a predetermined trajectory to the paper aligner;



a shaft coupled to the paper aligner and rotatably mounted in the central opening, said shaft having a cam follower fixedly mounted thereto, said cam follower being operable to ride on said camming surface; and

means for rotating the shaft.

4,319,744

JOGGER FOR THE LATERAL ALIGNMENT OF SHEETS IN SHEET DELIVERERS

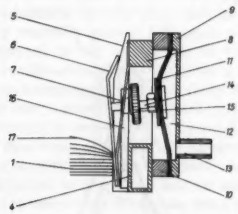
Hartmut Nagel; Hans Zimmermann, both of Coswig; Fritz Pieper, Radebeul, and Dieter Plage, Coswig, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Jan. 25, 1980, Ser. No. 115,285

Claims priority, application German Democratic Rep., Feb. 1, 1979, 210749

Int. Cl.³ B65H *31/36*

U.S. Cl. 271—222 **12 Claims**



1. A jogger for lateral alignment of sheets in a sheet-delivering device of a sheet-processing machine, such as a printing machine, comprising a displaceable diaphragm; a resiliently yieldable member; and a pusher member connected with said diaphragm and said resiliently yieldable member so that upon displacement of said diaphragm in one direction, said pusher member first moves toward a sheet-delivering device against the force of said resiliently yieldable member and then tilts after contacting a sheet stack in the sheet-delivering device, said diaphragm being elastic and pneumatically impingeable to perform the displacement, so that said pusher member automatically adjusts upon the sheet stack.

4,319,745

ARRANGEMENT FOR DIVERTING DOCUMENTS IN A MACHINE INCORPORATING MEANS TO SORT THE DOCUMENT

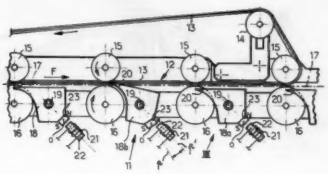
Patrick Pinard, Seiches-le-Loir, France, assignor to Compagnie International pour l'Informatique Cii Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 11, 1979, Ser. No. 102,403

Claims priority, application France, Dec. 28, 1978, 78 36797

Int. Cl.³ B65H *29/58*

U.S. Cl. 271—305 **11 Claims**



1. In an arrangement for diverting documents which travel along a main path of a sorting track, the arrangement comprising a diverter positioned opposite the sorting track, said diverter being mounted to pivot about an axis to enable it to occupy at least two main angular positions, including a first angular position in which the said diverter is clear of the said main path, and a second angular position in which the diverter intersects with the main path so as to deflect and guide a document traveling along the main path away from the said main path, the improvement comprising at least one permanent magnet fixed to the diverter, an induction coil connected to a source of DC voltage via a two-state control means, said induction coil being arranged close to the said magnet in a position which provides magnetic coupling between the said coil and the said magnet, so as to position the said diverter in one or the other of the said first and said second angular positions respectively when the said control means is in one or the other of its states, said induction coil including a soft iron core of magnetizable material which exhibits virtually zero retentivity, said permanent magnet being in the form of a straight bar and arranged such that its magnetic axis is substantially perpendicular to a plane passing through its center of symmetry and containing the said pivot axis, the core of said coil being situated substantially in the plane which contains the said pivot axis and which passes through the said center of symmetry of said magnet when said diverter is in said first angular position, and said control means being formed by a switch adapted to close the electrical circuit between the said source and the said coil in one of its states.

4,319,746

ROTATABLE SEESAW DEVICE

Edmond Chang, 3F.79 Nin-Po West St., Taipei, Taiwan

Filed Jun. 23, 1980, Ser. No. 162,181

Claims priority, application Taiwan, May 8, 1980, 69/22164

Int. Cl.³ A63G *1/32*

U.S. Cl. 272—30 **5 Claims**

1. A rotatable seesaw device comprising:

a seesaw body including a lever arm adapted to be supported at its mid-portion and a seating portion provided at each end of the lever arm,

an upstanding vertical support means,

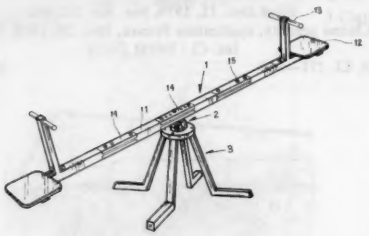
a pivotal arrangement for mounting said lever arm on said upstanding support means, including:

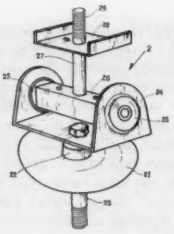
(a) a first pivotal means having a U-shaped bracket with vertical walls, bearing means in each of said vertical walls, a horizontal pivot bolt having its ends mounted in said bearing means, a vertically extending stud bolt having one end mounted on said horizontal pivot bolt and the other end being connected to said middle por-

tion of said lever arm to function as a fulcrum point and to permit the seesaw motion of the lever arm; and

(b) a second pivotal means having a vertical bolt connected to said upstanding vertical support means and to the center leg of said U-shaped bracket, bearing means in one of said vertical support means and said U-shaped bracket means to permit rotational movement of the lever arm relative to said vertical support means,

said first and second pivotal means providing simultaneous seesaw and rotating motion with a complex waveform resultant motion when force including components in the vertical and peripheral directions is applied to said lever arm.





4,319,747

CONVERTIBLE EXERCISE BENCH AND ACCESSORY APPARATUS

J. Frank Rogers, North Augusta Plz., North Augusta, S.C. 29841

Filed Aug. 27, 1979, Ser. No. 70,264
Int. Cl.[3] A63B *21/06*
U.S. Cl. 272—73 **9 Claims**

1. Multi-purpose body exercising apparatus comprising:

a longitudinal convertible exercise bench having a body supporting bench pad;

a ground engaging bench frame supporting said bench pad generally above the ground which includes first and second spaced opposed frame ends;

exercise accessory attachment means carried by said exercise bench facilitating the rapid exchange of a variety of accessory exercise apparatus;

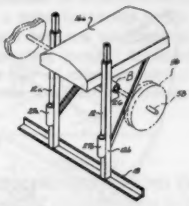
accessory exercise apparatus adapted for interchangeable connection to said exercise bench and bench frame by means of said accessory attachment means;

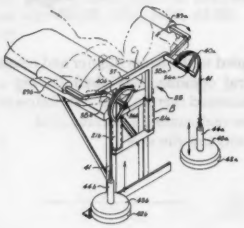
said accessory attachment means including spaced vertical tubular attachment means carried by said bench frame adjacent at least one of said ends;

said accessory exercise apparatus including a number of individual exercise devices for performing different body exercises;

horizontal tubular attachment means carried by said bench frame generally at or below the level of said bench pad, said horizontal tubular attachment means being hollow for receiving a weight bar therethrough for counter-balancing said exercise bench during attachment and operation of certain ones of said individual exercise devices;

each said exercise device including corresponding tubular connection means facilitating interlocking engagement with said tubular attachment means; and





said connection means and attachment means being uniform for each said exercise device providing rapid and simplified connection between each said exercise device and said bench frame;

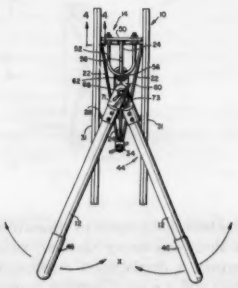
whereby said exercise bench may be readily converted to provide a number of different exercise events.

4,319,748

SPORTS TRAINING DEVICE

Efim Alter, 7533 Horrocks St. 1st Flr., Philadelphia, Pa. 19152

Filed Jun. 5, 1980, Ser. No. 156,566
Int. Cl.[3] A63B *69/00*
U.S. Cl. 272—93 **11 Claims**



1. A sports training device for improving the peripheral vision, footwork and upper body agility of a user, said device being adapted to be operated by said user and comprising:

(a) frame means adapted to support said device when in use, said frame means further comprising means to attach said device to a vertically disposed wall;

(b) oscillatory pendulum means comprising two angularly

disposed, perpendicularly suspended pendular members operably connected by attachment means to said frame, said members being adapted to follow an oscillating path when set in motion by said user;

(c) pivot means within said pendulum means adapted to establish particular oscillatory path taken by said pendular members when they are set in motion and further containing angular adjustment means adapted to establish the angular relationship between said members; and

(d) vertical adjustment means adapted to change the vertical relationship of said frame with said user and further comprising locking means adapted to hold said frame at the vertical height set after such change.

4,319,749

MULTIPLE EXERCISING DEVICE

Ferenc I. Agyagos, Sangin Bldg., 3-21-5 Akasaka, Minato-ku, Tokyo, Japan

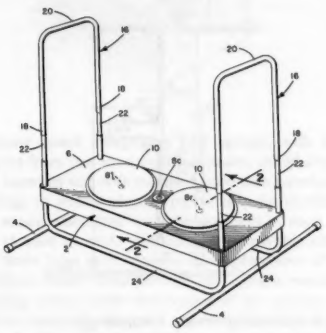
Filed Jan. 22, 1980, Ser. No. 114,368

Claims priority, application Japan, Jan. 30, 1979, 54-10314[U]

The portion of the term of this patent subsequent to Sep. 2, 1997, has been disclaimed.

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—146 **3 Claims**



1. An exercising device for exercising the body of a user comprising a raised supporting base stand assembly having positioned therein spaced apart pre-set holes; a pair of freely rotatable easily detachable circular disks each having a downwardly extending centrally located hub upon which it turns adapted to be inserted in one of said pre-set holes either in single or in dual combination to provide either a disk or a pair of disks that rotate independently of each other by the motion of the body of the user; a parallel pair of hand-gripping support bars, each one attached to and extending upwardly from opposite sides of said base stand assembly, one adjacent to the side of said base stand assembly adapted to receive one of the disks and the other adjacent to the other side of said base stand assembly adapted to receive the other disk; and a pair of spaced base stand floor stabilizing bars extending outwardly from the bottom of the base stand assembly to provide a stable and sturdy support for said device during its use.

4,319,750

GOLF SHAFT HAVING CONTROLLED FLEX ZONE

Paul A. Roy, Poway, Calif., assignor to Aldila, Inc., San Diego, Calif.

Filed Apr. 30, 1979, Ser. No. 34,414

Int. Cl.³ A63B *53/10*

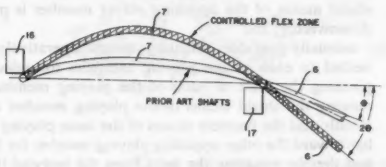
U.S. Cl. 273—80 B **13 Claims**

1. A golf club comprising:

(a) a club head; and

(b) an elongated tubular shaft having a relatively large diameter grip end tapering to a relatively smaller diameter head end attached to said club head,

(c) said tubular shaft being formed as one composite member solely from at least two different kinds of non-woven filamentary material, one of said filamentary materials having a relatively low modulus of elasticity and constituting solely said relatively larger diameter grip end of the shaft while the other filamentary material has a relatively significantly higher modulus of elasticity and constituting solely the remainder of the shaft, said relatively larger diameter grip end shaft portion formed from relatively



low modulus of elasticity filaments having a relatively higher degree of flexibility than the remainder of said shaft formed from said filamentary material having said higher modulus of elasticity so as to form a hinge point at the intersection of said high and low modulus portions of said shaft, said filamentary material being embedded in heat-hardenable synthetic resinous material and including two portions connected end-to-end in overlapping relationship and bonded together to form a continuous elongated tubular shaft of finite length, each of said two portions including a plurality of layers of said filamentary material.

4,319,751

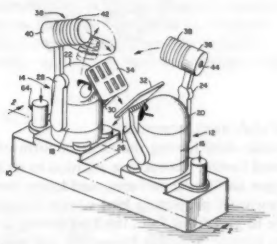
HAMMER GAME

Minoru Kurushima, and Akio Esaka, both of Tokyo, Japan, assignors to Epoch Company, Ltd., Tokyo, Japan

Filed May 16, 1980, Ser. No. 150,678

Int. Cl.³ A63F *9/14*; A63H *13/06*

U.S. Cl. 273—85 E **13 Claims**



1. A game apparatus comprising:

(a) a base housing;

(b) two playing members mounted on the base housing opposing each other, each of the playing members having (i) a body fixed to the base housing, and having a top flat mounting surface, (ii) a head releasably attached to and positioned on the top surface of the body, (iii) magnet and spring means for releasably attaching to and positioning the head on the body comprising a spring attached at one end to the inside of the head and the other end to the inside of the body, a first magnet mounted on the inside of the body, and a second magnet mounted on the inside of the head for engagement with the first magnet to position the head on the body and wherein the spring urges the head away from the body upon disengagement of the first and second magnets, (iv) a pair of arms pivotally connected to the body and normally biased to an upwardly-extended

position, (v) shield means connected at the outer end of one of the arms, and (vi) hammer means connected at the outer end of the other of the arms and oppositely disposed from the shield means of the opposite playing member, the hammer means comprising a hammer base attached to the arm and a hammer head formed of a flexible bellows fixedly attached at one end to the hammer base, the hammer head flexible bellows being retractable when the hammer head hits the shield means of the opposite playing member and wherein the hammer head hits the head of the opposing player for disengaging the magnets when the hammer means of that playing member is pivoted and the shield means of the opposing player member is pivoted downwardly; and

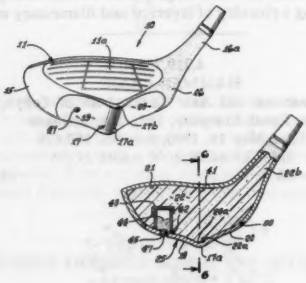
(c) manually-operable actuating means operatively connected to each of the playing members for selectively pivoting the arms of each of the playing members for moving the shield means of the playing member downwardly and the hammer means of the same playing member toward the other opposing playing member for hitting and thereby releasing the head from the body of the opposing playing member.

4,319,752

METAL SHELL GOLF CLUB HEAD, WITH KEEL

Stanley C. Thompson, 7851 Talbert St., Apt. 1, Playa del Rey, Calif. 90271

Filed Jul. 21, 1980, Ser. No. 170,957
Int. Cl.³ A63B *53/04*
U.S. Cl. 273—171 **5 Claims**



1. A golf club head, comprising

(a) a metallic shell having the exterior form of said head,

(b) the head having a front face adapted to strike a golf ball, and upper and lower surfaces, said lower surface defining a downwardly projecting keel which extends rearwardly relative to said front face, the keel having a downwardly convex surface which is forwardly and rearwardly elongated, said lower surface of the head having underside faces at opposite sides of the keel with each such face having downwardly concavity,

(c) said keel defining a portion of said shell,

(d) the shell defining a hollow interior, a portion of which lies adjacent an upwardly concave inner surface of the keel,

(e) foamed synthetic plastic material filling said hollow interior including said portion adjacent said inner concave surface of the keel, and

(f) a metallic weight structure attached to the shell at the inner side thereof and projecting to substantial extent into said hollow interior to be sidewardly surrounded and engaged by said foamed synthetic plastic material, said weight structure being everywhere offset from said inner concave surface of the keel, the keel also having upwardly convex inner surface extent, and the weight structure also extending closer to said keel upwardly convex inner surface extent than to said keel upwardly concave inner surface extent,

(g) the shell having an integral metallic plate portion peripherally weld connected to the remainder of the shell, said integral plate portion forming said keel and also defining said concave underside faces whereby said plate portion has butterfly V-shape, said plate portion having forward edges extending forwardly sufficiently to be welded to downwardly V-shaped extent of said front face, and having rearward edges located at the rearward periphery of said keel and welded to rearward extent of the head,

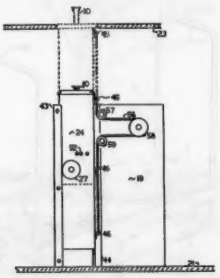
(h) the shell having a toe and a heel at opposite sides of a vertical plane passing forwardly through the keel, said weight structure located between said plane and said toe and carried by the plate portion intermediate said forward and rearward edges thereof.

4,319,753

GOLF BALL TEEING MACHINE

James H. Mann, 2389 Brown Bark Dr., Dayton, Ohio 45431

Continuation-in-part of Ser. No. 714,952, Aug. 16, 1976, abandoned. This application Mar. 24, 1978, Ser. No. 889,733
Int. Cl.² A63H *57/00*
U.S. Cl. 273—201 **7 Claims**



1. A golf ball teeing device, comprising:

a housing having an upper flat surface providing a tee area with an opening defined therein through which a golf ball can be raised from within said housing to a position for hitting by a golfer;

tee means having a portion for supporting a golf ball to be hit and movable substantially vertically from a lower most position within said housing to one of a plurality of selectable upper positions where a ball supported thereon will be disposed above said upper surface of said housing;

rack means supporting said tee means and having an upper surface substantially coextensive with said opening defined in said upper surface of said housing and surrounding said ball supporting portion of said tee means, said tee means being relatively movable within said rack means at a fixed rate relative thereto and substantially vertically between a lower most position at least as low as said lower most position of said tee means and an uppermost position in which said upper surface thereof is substantially in the plane of said upper surface of said housing;

ball supply means for supplying a ball to said tee means when it is in said lower most position;

reversible motor means mounted within said housing and selectively operable in either of two opposite directions upon receipt of an appropriate signal;

drive means coupling said motor means to said tee means and said rack means for causing said respective movements thereof; and

means for sensing a ball has been removed from said tee means and thereupon supplying said appropriate signal to said motor means for causing downward movement of

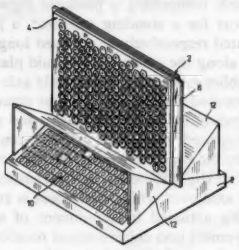
said tee means and said rack means, and for sensing when said ball supply means has placed a ball on said tee means and thereupon supplying said appropriate signal to said motor means for causing upward movement of said tee means and rack means.

4,319,754

WARFARE SIMULATING GAME APPARATUS

James J. Yaworsky, R.R. #1 Inglewood, Ontario, Canada (L0N 1K0)

Filed Jun. 13, 1980, Ser. No. 159,129
Int. Cl.³ A63F 3/00
U.S. Cl. 273—241 12 Claims



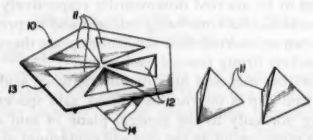
1. A game board comprising two upright web members spaced apart from one another, a removable shield disposed in the space between said web members, said web members defining openings in which playing pieces may be received, and blocking means associated with the openings of each web for selective closure thereof, wherein said removable shield isolates said webs from each other to allow placement of playing pieces without observation through the upright members and said blocking means limits observation of the opposite web to the portions essentially directed opposite the uncovered openings of each web when said shield is removed and including game condition playing pieces receivable within the openings of said webs and including a projecting portion which is visible when said associated blocking means closes an opening of said web members.

4,319,755

TOSSING GAME

Garry D. Orser, Sr., P.O. Box 341, Hartland, New Brunswick, Canada (E0J 1N0)

Filed Oct. 31, 1980, Ser. No. 202,620
Int. Cl.³ A63B 63/08
U.S. Cl. 273—401 7 Claims



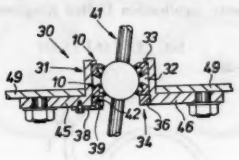
1. A tossing game comprising a target adapted to rest on a level surface and having plural top opening pyramid pockets, and a corresponding number of like shaped and sized pyramid game pieces adapted to be tossed from a distance by a player of the game into the pockets.

4,319,756

SPHERICAL SEAL ELEMENT

John E. Brown, Mansfield Woodhouse, England, assignor to West & Sons Engineers Limited, Nottinghamshire, England

Filed Feb. 27, 1980, Ser. No. 125,102
Int. Cl.³ F16J 15/32
U.S. Cl. 277—58 6 Claims



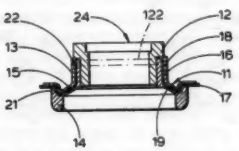
1. A bush unit for supporting and sealing a spherical member, the bush unit including in combination housing means having an internal bore formed therein, a pair of opposed annular seal elements which are axially movable toward one another supported by said housing means within said bore, each annular element having a radially inwardly directed lip portion adapted to abut with the spherical member, the sealing face of one seal element being arranged to face the sealing face of the other seal element so as to define a spherical seat in which the spherical member is adapted to be rotatably supported, each radially inward directed lip portion bridging a space in the bore between said housing means and the spherical member, the lip portion of each annular element being rigid enough to maintain said spherical seat when the annular elements are moved axially toward one another to place each element under axial compression for urging sealing contact between each spherically contoured sealing face and the spherical member.

4,319,757

END FACE THRUST SEALS

John F. Fitzpatrick-Ellis, Warwick, England, assignor to Automotive Products Limited, Warwickshire, England

Filed Jun. 30, 1980, Ser. No. 164,174
Claims priority, application United Kingdom, Jul. 5, 1979, 23436/79
Int. Cl.³ F16J 15/34
U.S. Cl. 277—81 R 8 Claims



1. An end face thrust seal for use between relatively rotatable parts and comprising:

an annular elastomeric ring having inner and outer peripheral rims linked by a frustoconical portion extending therebetween;

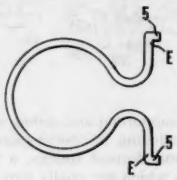
a diaphragm spring embedded in the elastomeric ring and having a continuous outer annular portion with a series of spaced spring fingers extending radially inwards and forming a frustoconical spring;

said outer annular portion being located at the outer rim of the elastomeric ring and the frustoconical spring being located in the frustoconical portion of the elastomeric ring;

and the spring fingers extend into the inner rim and have inner

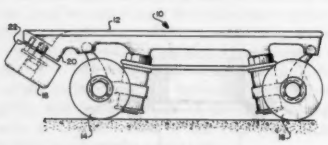
end portions that are bent to extend axially away from the base of the cone and re-inforce the inner rim.

4,319,758
RING SEAL
Terence P. Nicholson, Calf Hall, Muggleswick, Derwentside, Co. Durham, England
Filed Dec. 7, 1979, Ser. No. 101,198
Claims priority, application United Kingdom, Jan. 3, 1979, 00153/79
Int. Cl.[3] F16J 15/08
U.S. Cl. 277—205 4 Claims



1. A seal ring comprising a body of revolution about a central axis, said body being in radial cross-section of capital omega (ν) shape having a circular central segment and integral laterally extending terminal segments, the terminal segments extending in a common plane, aligned cylindrically and concentric with respect to the central axis of revolution and projecting beyond the peripheral limits of the circular segment, free ends of the terminal segments being bent to assume an orientation perpendicular to the terminal segments providing a pair of enlarged oppositely directed annular sealing edges, said circular segment being resilient and thereby deformable under pressure so as to exert a counter-pressure through the terminal segments when said sealing edges are engaged by opposed surfaces to be sealed and the ring is subjected to pressure.

4,319,759
TOE STOP AND ROLLER SKATE COMBINATION
Paul D. Neitz, 1400 Massillon Rd., Akron, Ohio 44306
Filed Apr. 29, 1980, Ser. No. 144,894
Int. Cl.[3] A63C 17/14
U.S. Cl. 280—11.2 2 Claims



1. In a roller skate, a metal skate plate including a front section having a rearwardly directed, downwardly inclined lower surface, said front section having a tapped hole extending thereinto from said surface,

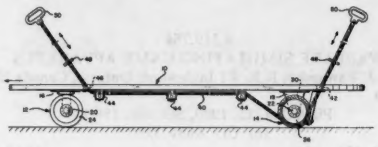
a cylindrical stop member,

a reinforcing means embedded in said stop member,

means engaging said hole and securing said stop member to said front section, and

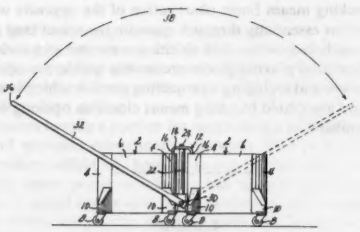
said stop member being made from a durable plastic material, and a lock pin embedded at a portion of said stop member and fixedly attached to said reinforcing means, and protruding therefrom towards said front section, said front section having a recess or hole in its lower surface for receiving said lock pin to aid in mounting said stop member on said roller skate.

4,319,760
OCCUPANT PROPELLED SKATEBOARD
Carmelo Romano, Lindenhurst, N.Y., assignor to Joseph Azar, Woodmere, N.Y.
Filed Mar. 28, 1980, Ser. No. 134,793
Int. Cl.[3] B62M 1/04
U.S. Cl. 280—11.115 7 Claims



1. A skateboard, comprising a platform forming an elongated foot support for a standing operator, a pair of roller assemblies mounted respectively at opposed longitudinal ends of said platform along the central axis of said platform, one of said roller assemblies comprising a rotatable axle and a pair of wheels fixedly secured thereto for conjoint rotation, an elongated chain extending below said platform and entrained upwardly through spaced holes arranged adjacent each roller assembly whereby the ends thereof may be grasped by separate hands of the user of the skateboard, and a transmission secured to said rotatable axle over which said chain is entrained, said transmission being actuated by movement of said chain to convert said movement into unidirectional rotation of said axle and said wheel and propel said skateboard.

4,319,761
MOP BUCKET CONNECTOR
William A. Wells, 6811 Blue Pkwy., Kansas City, Mo. 64129
Filed Jan. 10, 1980, Ser. No. 110,908
Int. Cl.[3] B62B 11/00
U.S. Cl. 280—47.36 2 Claims



1. A connector for joining two wheeled mop buckets disposed in end-to-end relation firmly together whereby said buckets may be wheeled from place to place as a unitary assembly, said connector comprising:

a. a clip of inverted U-form, having a pair of depending arms adapted to be inserted downwardly respectively into the two buckets, said arms being resilient and so pre-stressed that when so inserted their resilience causes them to press said buckets firmly toward each other,

b. a spacer bar disposed horizontally between said buckets when said clip is inserted as recited, said spacer bar extending normally to the general plane of said clip, this being a plane including the axis and centerlines of the arms of said clip, and between the lower end portions of said clip arms, whereby the resilience of said clip arms presses said buckets firmly against opposite sides of said spacer bar,

c. means disposed between said buckets and affixing said spacer bar to the top connecting portion of said U-shaped

clip, the confronting walls of said buckets being arcuately convex toward each other, and

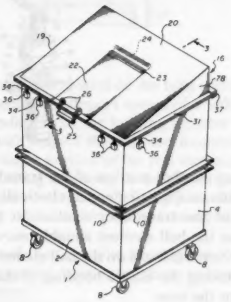
d. a plate affixed to the lower end of each of said clip arms and operable to engage the interior surface of the associated bucket wall, said plate being substantially wider than the clip arm laterally of the general plane of the clip, and curved about an axis parallel to the axis of curvature of the bucket wall but having a greater radius of curvature, whereby to engage said bucket wall only at its extreme lateral edge portions.

4,319,762

STORAGE AND DISPOSAL BIN FOR WASTE FATTY MATERIALS

Philip N. Streit, Rte. #1, Box 76B50 Opelousas, LA, and Lyle E. Leininger, Rte. 8 Box 537, Lakeside, Tex. 76108

Filed Jun. 9, 1980, Ser. No. 157,881
Int. Cl.³ B01D *35/02*; B62B *3/02*
U.S. Cl. 280—79.2 **11 Claims**



1. A sanitary apparatus for storage and transportation of waste fatty materials for reprocessing comprising

a fluid tight box shaped bin having an open top and tapering downward to a closed bottom,

said bin being reinforced around periphery of the bottom and having a plurality of casters supporting the same for rolling movement on the floor or ground,

a removable cover, having an access opening, fitting tightly over the open top of said bin and locked thereto, preventing unauthorized removal,

a lid hinged to said cover closing said access opening and spring loaded toward a fully open position,

a pull latch positioned to secure said lid in closed position and operable by pulling to permit said lid to spring open, and

a perforate plate or screen secured on the inner surface of said cover covering the inside of said access opening.

4,319,763

COLLAPSIBLE LIGHTWEIGHT BICYCLE FENDERS AND METHOD OF ATTACHING FENDERS TO THE BICYCLE FRAME

Stoughton K. White, 3470 S. Logan, #24, Englewood, Colo. 80110

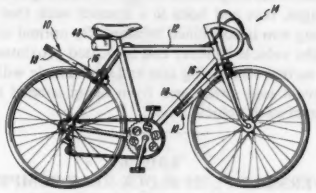
Filed Jul. 27, 1979, Ser. No. 61,385
Int. Cl.³ B62D *25/16*
U.S. Cl. 280—152.3 **9 Claims**

5. A method of using a flexible and hand-twistable tie for attaching a selectively removable fender to a bicycle or the like having two laterally spaced apart frame members between which a wheel is positioned, said tie having free ends, comprising:

positioning the fender between the two spaced apart frame members with a portion of each lateral side of the fender interiorly adjacent a different one of the two spaced apart frame members

flexibly extending the free ends of at least one tie from points spaced longitudinally of the fender on each lateral side of the fender at a position adjacent the frame member, and

connecting the fender to the two spaced apart frame members only at the single locations on opposite lateral sides of the fender adjoining the frame members and supporting the fender at an angular relationship relative to the frame



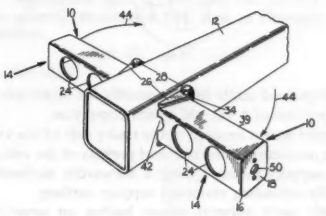
members and spaced from the wheel between the frame members as a result of the opposite connections at the single locations on each lateral side of the fender by bending each tie with only hand movement into contacting relationship with the adjacent frame member on opposite longitudinal sides of said adjacent frame member.

4,319,764

MUD FLAP MOUNTING DEVICE FOR TRUCKS AND TRAILERS

Gene C. Whitaker, P.O. Box 627, Wilbur, Oreg. 97494

Filed Nov. 29, 1979, Ser. No. 98,534
Int. Cl.³ B62B *9/16*
U.S. Cl. 280—154 **1 Claim**



1. A mounting device for supporting mud flaps on a vehicle such as a truck, comprising:

(a) a swing arm, said swing arm extending generally horizontally and transverse to the length of said vehicle;

(b) pivot means for permitting said swing arm to be freely rotated about a generally vertical pivot axis;

(c) position limiting means for preventing rotation of said swing arm in a direction toward the rear of the vehicle beyond a position where said swing arm is substantially normal to the length of said vehicle;

(d) torque responsive means for preventing rotation of said swing arm in a direction toward the front of the vehicle when less than a predetermined amount of torque is applied to said swing arm and allowing rotation when greater than said predetermined amount of torque is applied to said swing arm;

(e) adjustment means associated with said torque responsive means for selectively adjusting the level of torque which must be applied to said swing arm to cause it to commence rotation;

(f) means for attaching mud flaps to said swing arm; and

(g) wherein said pivot means comprises a pair of horizontal flanges fixedly attached to and extending outwardly from said vehicle, said swing arm has an inner end and a forward side and a pair of horizontal ears located on said forward side, said ears extending between said horizontal

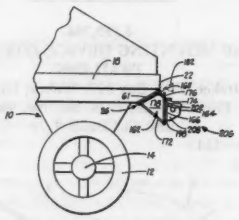
flanges with a respective one of said ears adjacent to each of said horizontal flanges, said torque responsive means comprises coaxial vertically aligned bores defined in said flanges and said ears, and including a bolt extending through respective ones of said bores in at least one of said pair of flanges and the respective adjacent ear, and said position limiting means comprises locating said horizontal flanges, ears and bolts in a manner such that when said swing arm is positioned substantially normal to the length of the vehicle its inner end is located proximate the vehicle so that such swing arm and said vehicle will interact to prevent said swing arm from being rotated toward the rear of such vehicle.

4,319,765

REVERSIBLE PUSH BLOCK-REAR BUMPER AND PINTLE HOOK ASSEMBLIES

Glen F. Rosenbaum, Elk Point, S. Dak., assignor to CMI Corporation, Oklahoma City, Okla.

Division of Ser. No. 63,959, Aug. 6, 1979, Pat. No. 4,273,369.
This application Aug. 25, 1980, Ser. No. 180,839
Int. Cl.³ B60D *1/14*
U.S. Cl. 280—504 **4 Claims**



1. An improved pintle hook assembly for attachment to the rear end portion of a vehicle which comprises:

(a) support means secured to the under side of the vehicle in close proximity to the rear end portion of the vehicle, said first support means having a forwardly inclined downwardly extending rearward support surface;

(b) pintle hook support means having an upper support member and a vertically disposed rearward member connected to said upper support member, said upper support member having an inclined connecting surface for mating with the forwardly inclined downwardly extending rearward support surface of said support means;

(c) pintle hook means secured to the vertically disposed rearward member of said pintle hook support means so that said pintle hook means extends in a rearward direction therefrom; and

(d) first fastening means for securing the inclined connecting surface of said pintle hook support means to the support surface of said support means.

4,319,766

VEHICLE TRAILER HITCH

Walter V. Corteg, Utica; Jack K. Gillies, Highland, and Alfred B. Sauer, Farmington Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 25, 1980, Ser. No. 162,757
Int. Cl.³ B60D *1/06*
U.S. Cl. 280—511 **3 Claims**

1. A trailer hitch for monitoring the vertical component of loading induced thereon by an attached trailer comprising:

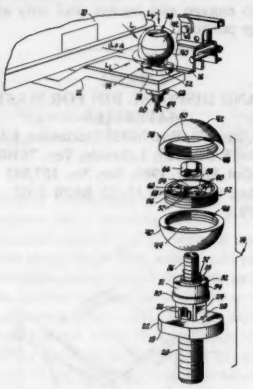
a base adapted to be attached to a vehicle and including a first vertically directed guide means,

a partially hollow ball element,

a second vertically directed guide means associated with the ball element to slidably mount the ball element on the base for relative vertical movement with respect to the base,

a vertical load measuring transducer within the ball element,

means securing one portion of the transducer to the ball element and locating the transducer in the horizontal plane of bisection of the ball element to transfer vertical loads from the ball element to the transducer,



means fixing another portion of the transducer to the base,

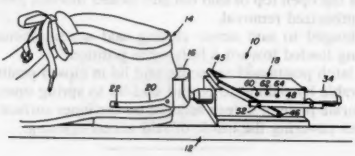
vertical loads on the ball element elastically bending the one portion of the transducer relative to the other portion thereof as the ball element slidably moves relative to the base, the vertical loads on the ball element being measured by monitoring the elastic bending of the transducer with respect to the base.

4,319,767

HEEL BINDING FOR CROSS-COUNTRY SKIS

Carl G. Emilson, Box 214, Cohasset, Mass. 02025

Filed Apr. 7, 1980, Ser. No. 138,173
Int. Cl.³ A63C *9/086*
U.S. Cl. 280—614 **14 Claims**



1. Apparatus for binding a boot to a ski, comprising

(a) a heel plate for mounting to the rear part of said boot, and,

(b) a multi-position mechanism for mounting to the upper face of said ski rearwardly of said boot,

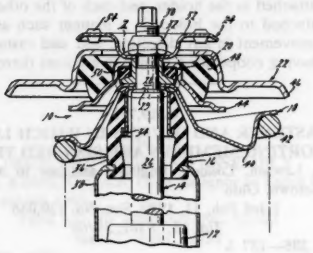
(c) said plate being formed with a rearwardly facing groove and an indent therein, said groove extending in a direction generally upwards from the heel of said boot along the back thereof when said plate is on said boot,

(d) said mechanism including a detent and means for moving said detent selectively from a position of engagement with said indent to a position of engagement only with said groove to a position disengaged from said plate whereby the heel portion of said boot will be, respectively, locked against said ski, free to move only in a direction generally perpendicular to the top face of said ski and freely movable.

4,319,768
VEHICLE SUSPENSION STRUT

Ralph A. Youngdale, Union Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 3, 1980, Ser. No. 137,051
Int. Cl.³ B60G *15/02*
U.S. Cl. 280—668 **5 Claims**



1. In a vehicle suspension strut of the type including a housing member connected to support means of a vehicle wheel, a rod member extending from the housing member and reciprocably moveable with respect thereto, and mounting means for resiliently connecting a portion of the rod member to the body of the vehicle including a bearing assembly carried on the rod member portion and received in a bearing pocket formed in the resilient mounting means, an improved bearing assembly comprising:

A. a generally hat shaped metallic bearing member having;
1. an inner diametral bearing surface engaging said rod member portion;
2. first and second outer diametral sealing surfaces; and
3. a frusto-conical shoulder surface extending between said first and second outer diametral sealing surfaces; and

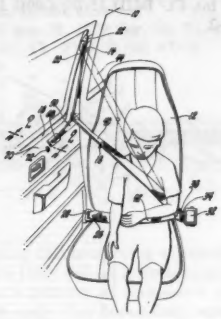
B. a generally cylindrical seal member having:
1. an outer mounting diametral portion received in press fit relationship in said bearing pocket;
2. first and second inner sealing portions sealingly engaging said first and second bearing member sealing surfaces; and
3. a frusto-conical surface complementary to and abuttingly engaging said bearing member shoulder surface whereby upon imposition of eccentrically directed loads on said rod member self centering of said improved bearing assembly with respect to said vehicle suspension strut is effected.

4,319,769
TETHER BELT FOR PASSIVE SHOULDER BELT SYSTEM

Edward E. Compeau, deceased, late of Fraser, Mich. (by Patricia J. Compeau, legal representative), and James A. Winnale, Warren, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 12, 1980, Ser. No. 148,796
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—808 **3 Claims**

1. In combination: a vehicle body having a seat located laterally adjacent a door hinged for movement between open and closed positions; a shoulder belt having an outboard end mounted on the upper rear corner of the door and an inboard end; retractor means mounted on the vehicle body inboard the occupant seat for winding the inboard shoulder belt end to establish the shoulder belt in a restraining position diagonally across the occupant torso when the door is closed and permitting outward movement of the shoulder belt with the door to an occupant access position when the door is opened; a tether belt having a first end attached to the shoulder belt intermediate the outboard and inboard ends and a second end, and reel means rotatably mounted on the door in vertically spaced relation from the outboard shoulder belt end and having the second end of the tether belt connected thereto so that extension and retraction of the tether belt upon reel rotation causes

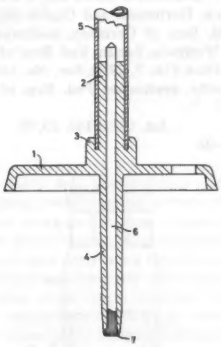


the tether belt to deflect the diagonal path of the shoulder belt to a modified diagonal restraint position particularly suited to the size of the seat occupant.

4,319,770
SKI POLE

Peter Drössler, Isny, Fed. Rep. of Germany, assignor to DSI-Sportartikel GmbH, Weitnau, Fed. Rep. of Germany

Continuation of Ser. No. 2,838, Jan. 11, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,751
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2807800
Int. Cl.³ A63C *11/24*
U.S. Cl. 280—824 **3 Claims**



1. A ski pole comprising

a tubular stem having an inner wall,

a bracing disc being secured to the tubular stem,

a pin having a shank portion and a small head with a cavity ground therein forming a lower tip of the pole,

a stud of tubular construction being integrally and concentrically formed on said bracing disc extending from one side of the disc into the end portion of said tubular stem,

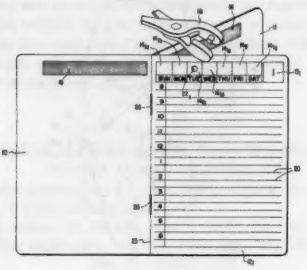
a tubular sheath integrally and concentrically formed on and extending from the other side of said bracing disc and having a considerably smaller outside diameter for receiving said pin than said tubular stud,

said shank portion of said pin being driven longitudinally through said tubular sheath and through said tubular construction of said stud and expanding said stud into a tight frictional lock with said inner wall of said stem.

4,319,771
PROGRAMMABLE AGENDA

Rafael Esquivel Yglesias, P.O. Box 3569, San Jose', Costa Rica

Filed May 15, 1980, Ser. No. 150,617
Int. Cl.[3] B42D 15/00; G09D 3/00
U.S. Cl. 283—2 8 Claims

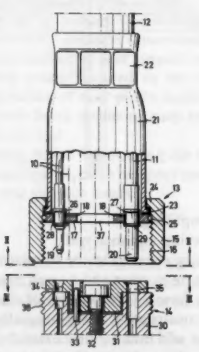


1. A programmable agenda comprising a series of sequentially numbered pages capable of being aligned one on top of another, each number corresponding to a date in a month, each page having inscribed thereon a row of seven boxes, the boxes on all pages being in registration when the pages are aligned one on top of another, said boxes further defining seven columns extending in a direction perpendicular to the plane of each page when the pages are aligned one on top of another, each box in a given row bearing the name of a different day of the week, and the boxes in each column bearing the names of the days of the week in sequence.

4,319,772
HYDRAULIC COUPLING DEVICE

Walter Weirich, Dortmund, and Gunter Hennlich, Hattingen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Feb. 7, 1980, Ser. No. 119,278
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1979, 2904867
Int. Cl.[3] F16L 35/00
U.S. Cl. 285—26 9 Claims

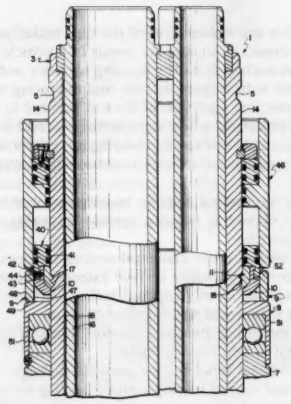


1. A hydraulic coupling arrangement comprising a multi-line hose, a coupling device surrounding an end portion of said multi-line hose and having a plurality of plug pins, a holder for holding the plug pins, said coupling device including an interconnected casing and sleeve means, and means connecting said holder to said casing means, and a connector having a plurality of sockets, each plug pin hydraulically connecting a respective line of the hose, and the plug pins each mating with a respective socket of the connector, wherein one of the plug pins is longer, and has a larger diameter than the other plug pins and constitutes an alignment pin for accurately aligning all of the plug pins with the corresponding sockets of the connector, and wherein said one plug pin is connected to a return line of the hose, and said other plug pins are each connected to a respective pressure line of the hose, said plug pins being positioned on a common pitch circle of the holder, said one plug pin being rigidly attached to the holder, and each of the other plug pins being attached to the holder in a manner such as to permit limited movement in any direction, and said casing and connector having cooperating connecting means therebetween.

4,319,773
FASTENER AND DEVICES IN WHICH LOAD SUPPORTING MEMBERS ARE SECURED THEREBY

John E. Lawson, London, England, assignor to Armco Inc., Middletown, Ohio

Filed Feb. 11, 1980, Ser. No. 120,046
Int. Cl.[3] F16L 39/00
U.S. Cl. 285—137 A 16 Claims



1. In a device in which large axial loads are to be transferred between two components of the device, the combination of

a first load-supporting member having a cylindrical surface,

said cylindrical surface having at least one transverse annular groove,

one side wall of said groove being frustoconical and constituting a first load-bearing surface;

a resilient split fastener ring comprising

at least one annular rib having a second frustoconical load-bearing surface and being shaped and dimensioned to be accommodated by said groove,

a third frustoconical load-bearing surface parallel to and facing away from said second load-bearing surface, and

a cylindrical surface which is spaced radially from said rib, faces away from said rib and joins said third load-bearing surface in an annular corner,

said ring being substantially relaxed and undistorted and having said rib engaged in said groove with said second frustoconical load-bearing surface in flush engagement with said first frustoconical load-bearing surface and with said third frustoconical load-bearing surface slanting away from said cylindrical surface of said first load-supporting member;

a second load-supporting member connected to said first load-supporting member by said split fastener ring,

said second load-supporting member having a cylindrical surface telescopically engaged with said cylindrical surface of said fastener ring, and

a fourth frustoconical load-bearing surface in flush en-

gagement with said third frustoconical load-bearing surface; and

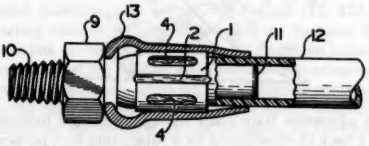
additional means engaged with said second load-supporting member to prevent said first and second load-supporting members from being significantly moved telescopically relative to each other in a direction which would separate said fourth frustoconical load-bearing surface from said third frustoconical load-bearing surface.

4,319,774

HOSE AND COUPLING ASSEMBLY

Edward M. Kavick, Chardon, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 19, 1979, Ser. No. 31,682
Int. Cl.³ F16L *33/22*
U.S. Cl. 285—256 **13 Claims**



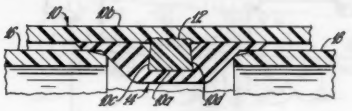
1. A substantially tubular shaped contractible insert for use in conjunction with a permanently attachable or reusable coupling to improve the securement of the coupling to the end of a hose used in the conveyance of fluids under pressure, said coupling having a body member having means for attaching the coupling to a source of fluid disposed at a first end thereof, a substantially tubular shaped nipple extending from a second end of the body member disposed away from the attachment means end and adapted to extend into the bore of a hose, and a compressible shell extending from the body member second end coaxially about the nipple and adapted to enclose the outer surface of the hose and compress the insert against the outer surface of the hose, said insert adapted to be disposed coaxially between the shell and the outer surface of the hose and having: a separation space defined by apposed facing edges in the wall of the insert that extend longitudinally along the entire length of the insert and are spaced apart a distance sufficient to insure that the edges do not touch each other for at least a substantial distance along their length upon contraction of the insert during the securement process; one or more longitudinally extending primary elongate openings through the wall of the insert laying along one or more longitudinally extending axis that are distributed, along with the separation space axis, in a substantially uniform array about the circumference of the insert; said separation space axis and each of said primary opening axis skewed from 0° to about 45° from the central longitudinal axis of the insert; and said separation space having an area thereof that, prior to contraction of the insert during the securement process, is substantially the same as the sum of the areas provided by the one or more primary openings laying along each of the one or more longitudinally extending primary opening axis of the array, such that, upon contraction of the insert, portions of the wall of the hose compressed between the wall of the insert and the nipple are caused to extend into the separation space and the primary openings to provide an improved longitudinally extending uniformly circumferentially distributed gripping engagement between the insert and the wall of the hose.

4,319,775

PIPE COUPLING WITH INTERNAL STOP COLLAR AND ELASTOMERIC PIPE SEPARATORS INTERLOCKED THEREWITH

Joe B. Bennett, Conroe, Tex., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 31, 1979, Ser. No. 71,612
Int. Cl.³ F16L *21/00, 47/00*
U.S. Cl. 285—383 **3 Claims**



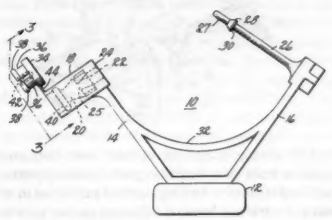
1. A pipe coupling (**10**) comprising a generally cylindrical main body portion (**10*b***) and an internal annular stop collar portion (**10*a***), and a plurality of elastomeric pipe separators (**14**) separate from each other and initially separate from the stop collar portion (**10*a***), the pipe separators (**14**) being interlockable with the stop collar portion (**10*a***) in any desired arcuately spaced relationship with each other therealong.

4,319,776

SEAL

Sigurd M. Moberg, Etlan, Va., assignor to E. J. Brooks Company, Newark, N.J.

Filed May 11, 1979, Ser. No. 38,324
Int. Cl.³ B65D *33/34*
U.S. Cl. 292—322 **6 Claims**



1. A one-piece plastic seal, comprising a medial portion, a pair of arms extending from the medial portion, the ends of said arms being spaced apart and having cooperating engaging means on the ends thereof for locking engagement with each other, at least one of said arms being flexible so that the arms can be manually flexed together, said arms being so positioned and dimensioned that when flexed together, the cooperating means enter into engagement with each other, and having spring-back force when flexed together sufficient to cause said arms to separate unless said cooperating means is fully engaged, said spring-back force being provided in part by flexible means joining the arms in spaced relation to the medial portion.

4,319,777

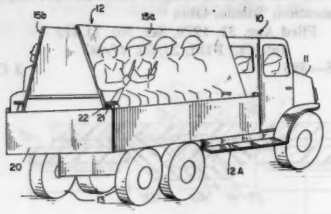
TROOP CARRIER

William J. H. Law, Port Chester, N.Y., assignor to AAL Enterprises, Inc., New York, N.Y.

Filed Apr. 24, 1980, Ser. No. 143,447
Int. Cl.³ B60N *1/00*
U.S. Cl. 296—64 **2 Claims**

1. A troop carrier vehicle having a carrier body adapted to transporting troops which includes an armored panel extending lengthwise of said body in approximately upright position having an exterior side set inwardly from one side of said body, a side panel on said body located along said one side of said

body on said exterior side of said armored panel, said side panel being pivotly mounted along the lower edge thereof whereby said side panel can be lowered from an upright position in front



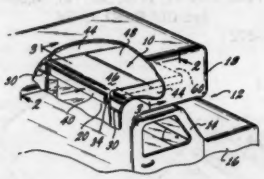
of said armored panel outwardly of said body portion and seating means positioned along the exterior side of said armored panel between said armored panel and said side panel.

4,319,778

CAB-OVER MOTORHOME BED STRUCTURE

Larry W. Leonard, Redlands, and Arie Shikler, Mission Viejo, both of Calif., assignors to Fleetwood Enterprises, Inc., Riverside, Calif.

Filed Jun. 16, 1980, Ser. No. 159,648
Int. Cl.³ B60P *3/34*
U.S. Cl. 296—166 **9 Claims**



1. A bed structure including at least two bottom mattress supports and at least two mattress pads, said supports and said pads of said bed structure having normal positions in which the tops of said supports are located adjacent to one another and in which said mattress pads cover said supports and are located in side-by-side relationship, at least one of said supports and at least one of said pads being movable so as to reduce the area occupied by said bed structure in which the improvement comprises:

means supporting a first of said supports so that it is capable of being moved from its normal position with respect to a second of said supports to a position above said second support,

a first mattress pad located on said first support so as to be movable therewith,

a second mattress pad located on said second support, said second pad being capable of being moved with respect to said second support so as to be positioned so that it is spaced from said second support above said second support,

said first and said second pads including side edges which are located adjacent to one another when in said normal positions, each of said side edges including a sloping surface, said sloping surfaces being sloped with respect to one another so as to be capable of elevating said second pad so that it is positioned above said first pad when said first support is moved from its normal position toward and over said second support,

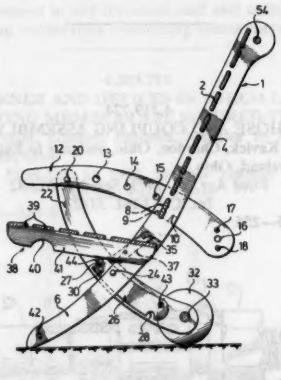
strap means connecting to said second pad with said second support for preventing said second pad from being moved with said first pad and said first support as said first support is moved from a position over said second support to its normal position.

4,319,779

ADJUSTABLE LAWN CHAIR WITH SEPARATE FOOTREST

Xaver F. Leonhart, 8385 Harburg, near 8385 Pilsting, Fed. Rep. of Germany

Filed Jun. 11, 1980, Ser. No. 158,625
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1979, 29237250
Int. Cl.³ A47C *4/04*
U.S. Cl. 297—19 **4 Claims**



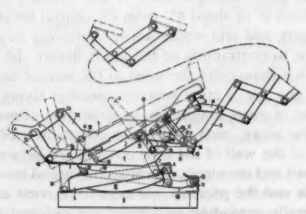
1. An adjustable lawn chair having a separate footrest, as well as a back (1–4) adjoined by a supporting foot portion (5, 6) extending at a small angle thereto, a pivotable foot (21, 22) forming an adjustable cross with the supporting foot portion, and with an armrest (11, 12) articulated to the pivotable foot (21, 22), characterized by said back (1–4) including side members (3, 4), a pivot journal (7, 8) approximately at the center of the length of each respective side member and projecting to the insides thereof, a seat (38) having one end freely movably articulated (35) to said side members in proximity to the pivot journals (7, 8), said seat having side frame members (41), at least one recess (40) on the underside of each of said side frame members, a fixed strip (25, 26) on the inside of the pivotable foot (21, 22) equipped at the ends with recesses (27, 28), a crossbar (44) adapted to be removably received in said recesses (27, 28), an inwardly directed stop pin (29, 30) on said fixed strip (25, 26) adapted to move into contact with the front edge of said side members (3, 4), detents (9, 10) on said armrest (11, 12) milled into approximately one half the depth thereof for engaging said pivot journal (7, 8), and said armrest having at least one fixed cross strut (17, 18) at the free ends thereof.

4,319,780

ROCKER-RECLINER CHAIR

Walter C. Rogers, Jr., P.O. Box 685, Denton, N.C. 27239

Filed Oct. 16, 1979, Ser. No. 85,429
Int. Cl.³ A47C *1/02*
U.S. Cl. 297—85 **8 Claims**



1. A three-way rocker-recliner chair having a base, a rocker

frame (6) mounted on the base for rocking movement in the forward-rearward direction of the chair, a carrier link (4), front and rear carrier mounting links (7, 5A) mounting the carrier link to the rocker frame for movement generally forwardly and rearwardly of the rocker frame, a seat including a seat link (5), armrests fixed to the seat for movement with the seat as a unitary structure, a seat mounting link (3) pivotally interconnected and mounting the seat link to the carrier link, a backrest including a backrest link (1) pivotally mounted to the carrier link and pivotally connected to the seat link for movement relative thereto, said backrest link (1) and seat mounting link (3) serving to mount the seat link relative to the carrier link, a seat support link (2) pivotally connected to the seat link and the carrier link to provide support for the seat link when the chair is in advanced reclining positions wherein the backrest has moved relative to the seat, a footrest including a footrest linkage mounting the footrest to the seat for movement between extended and retracted positions, a manual control handle connected to the footrest linkage to actuate the same between extended and retracted positions, a transmission link (8) interconnecting the footrest linkage and one of the carrier mounting links (5A, 7) for driving the carrier link forwardly relative to the rocker frame when the footrest is moved to extended positions, and sequencing linkage (12, 12A, 12B) preventing relative movement between the backrest link (1) and seat link (5) and the carrier link (4) during an initial phase of movement of the footrest from retracted to extended position and subsequently allowing such relative movement to phace the chair in advanced reclining positions when pressure is exerted on the backrest by the occupant of the chair, and wherein the seat link (5) has a generally V-shape including a bight portion and extends upwardly at its rear end and wherein said seat support link (2) is connected to said seat link in the area of said bight portion, and wherein when moving to advance reclining positions the backrest link (1) fulcrums about a rear end portion of the carrier link.

4,319,781

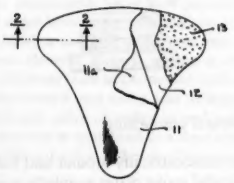
BICYCLE SEAT COVER

Kenji Tsuge, 1-3-16, Higashi Kaigan, Tsuijido, Fujisawa-Shi, Kanagawa-Ken, Japan

Filed Jul. 14, 1980, Ser. No. 167,831

Int. Cl.³ B62J *1/00*

U.S. Cl. 297—214 **9 Claims**



1. A bicycle seat cover comprising

an inner central portion of a compliant material,

a middle layer covering at least the top surface of said central portion, said middle layer being of a material having a low friction outer surface, and

an outer layer covering at least the top surface of said middle layer having an outer surface of substantially higher friction than the inner surface thereof such that the clothing and body portions contacting said outer layer will tend to frictionally engage the outer surface thereof with slidable motion being permitted between the outer and middle layers.

4,319,782

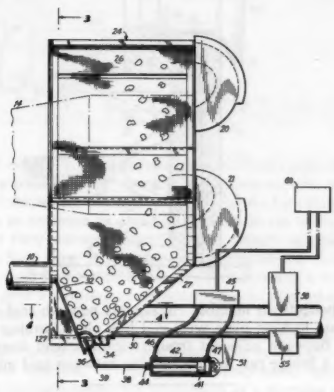
MEANS FOR CONTROLLING FEED OF PARTICULATE MATERIAL INTO AIRLIFT PIPE

John P. Latimer, Newport News, Va., assignor to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Jun. 6, 1980, Ser. No. 157,292

Int. Cl.³ E02F *3/94*

U.S. Cl. 299—1 **21 Claims**



1. A dredge assembly comprising: ore particle collection means designed to remove solid ore particles from the ocean floor surface; fluid flow conduit means connected at one end to the collection means and designed to be connected at a second end to a vertical airlift pipe system and thus to convey a suspension of ore particles-in-water between the collection means and such vertical airlift pipe system; density measuring means operatively connected to the conduit means and capable of signaling a change in concentration of suspended solids relative to a predetermined value; and ore particle-bypass means operatively connected to the dredge assembly between the collection means and the second end of the conduit means, in signal-responsive connection with the measuring means and designed to reject suspended ore particles before reaching the second end of the conduit means,

whereby a change in density of suspended solids to above a predetermined value causes rejection of ore particles before reaching the airlift pipe.

4,319,783

CONVEYING TROUGH CONNECTOR AND MINING MACHINE GUIDE RAIL BRIDGE

Ernst Braun, and Gert Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach & Braun, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 167,642

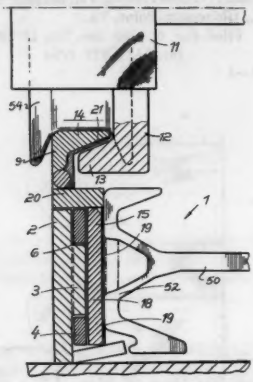
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2927965

Int. Cl.³ E21C *35/08*

U.S. Cl. 299—43 **5 Claims**

1. A conveying trough for chain scraper conveyors, comprising a plurality of trough sections for the conveyed material each having a side wall including a guide plate with a portion adjacent an end thereof with a recess on its interior forming a pocket, said guide plate having at least one projection extending into said pocket, a link plate disposed in the pockets of adjacent guide plates of adjacent trough sections and having eylets into which said projections extend with clearance between said projections and said link plate, a locking plate overlying said link plate on its interior, a guide rail secured to said guide plates of each trough section and each having a claw portion projecting inwardly of the sides of said guide rail and

defining a slide surface on its underside and having a top surface forming a trackway, a machine overlying said trough section having a member adapted to run over said trackway



and a hold-down member engageable beneath said slide surface, said locking plate with said link plate forming an insert bridge between adjacent trough sections, said insert bridge having a bridge rail section running between said guide rails.

4,319,784

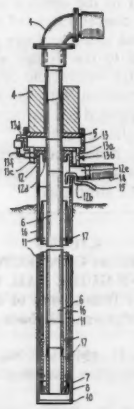
APPARATUS FOR WATER JET AND IMPACT DRILLING AND MINING

Peter Claringbull, Kuala Lumpur, Malaysia, assignor to Conzinc Riotinto Malaysia Sendirian Berhard, Malaysia

Filed Jun. 4, 1980, Ser. No. 156,507

Int. Cl.³ E21C *45/00*

U.S. Cl. 299—64 **7 Claims**



1. Subterranean drilling and mining apparatus, comprising

a cylindrical casing pipe to line a borehole to be formed by the apparatus;

an inner drill string assembly movable vertically within the casing pipe and comprising an inner pipe, an intermediate pipe which is slidable in the outer casing pipe and which encompasses the inner pipe so as to define an annular clearance space between it and the inner pipe, and a drilling shoe interconnecting the bottom ends of the inner pipe and the intermediate pipe and formed with a plurality of drilling jet passages communicating with said annular clearance space;

mining jet means comprising at least one mining nozzle extending through the wall of the intermediate pipe above the drilling shoe;

water inlet means for admitting water under pressure to the annular clearance space between the intermediate pipe and the main pipe; and

impact means for delivering impact blows to the casing pipe to drill and case a borehole by operation of the impact means to drive the casing pipe downwardly while maintaining the inner drill string assembly retracted therein sufficiently to maintain said mining jet means within the casing pipe, means for supplying water under pressure via the water inlet means to the annular clearance space between the intermediate pipe and the inner pipe to issue therefrom through the drilling jet passages as drilling jets to assist penetration of the casing pipe and means for extending the inner drill string assembly downwardly within the casing pipe to bring the mining jet means beneath the bottom end of the casing pipe to allow water under pressure to issue therethrough as at least one mining jet effective to excavate the material to be mined, the inner pipe serving as an extraction pipe for extraction of expended water and spoil during both drilling and mining operations to mine material surrounding the bottom of the bore hole.

4,319,785

VEHICLE WHEEL

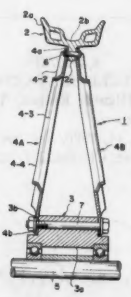
Masahiro Sato, Asaka, and Norio Tanaka, Toda, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1979, Ser. No. 96,521

Claims priority, application Japan, Nov. 22, 1978, 53-161194[U]

Int. Cl.³ B60B *1/10*

U.S. Cl. 301—6 CS **6 Claims**



1. A vehicle wheel comprising:

a hub;

a rim disposed concentrically around said hub; and

a plurality of radial spoke plates angularly spaced from each other and connecting said hub and said rim together, each of said spoke plates including:

a pair of axially aligned spaced plate members;

said pair of plate members being combined to form in a vertical cross-section a isosceles triangle, with the apex on the rim side and the base on the hub side, so that each said pair of plate members has a bent area adjacent an area at which said rim and said spoke plate are connected together;

each said pair of plate members comprising a central web and turned, longitudinal marginal free edge portions on both sides of said central web; and

said turned marginal edge portions being substantially directed away from the other one of said pair of plate mem-

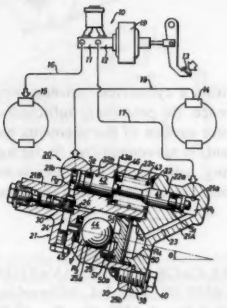
bers, substantially in the axial direction of said wheel, and extending substantially along said central web beyond portions corresponding to said bent area of said plate member on the rim side.

4,319,786

BRAKE PRESSURE CONTROL DEVICE OF DECELERATION RESPONSIVE TYPE

Tomoyuki Nogami, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 20,096, Mar. 13, 1979, abandoned. This application Sep. 18, 1980, Ser. No. 188,583
Claims priority, application Japan, May 29, 1978, 53-64171
Int. Cl.³ B60T *8/14*
U.S. Cl. 303—6 C **6 Claims**



1. A brake pressure control device for installation in a vehicle braking system between a master cylinder and a wheel cylinder, the control device including:

a first housing section having an inlet port for connection to said master cylinder and provided at the inner end face thereof with an annular protrusion in communication with said inlet port;

a second housing section having an outlet port for connection to said wheel brake cylinder and provided at the inner end face thereof with a stepped inner bore in communication with said outlet port, said first and second housing sections being fitted to each other at their inner end faces such that said annular protrusion is mated within a large diameter portion of said inner bore to provide a valve chamber; and

a cut-off valve including a valve seat provided on the side wall of said inner bore to permit the flow of fluid between said valve chamber and said outlet port and an inertia-controlled valve element housed within a small diameter portion of said inner bore to cooperate with said valve seat and movable toward said valve seat to interrupt the flow of fluid from said valve chamber to said outlet port when said valve element is subjected to a deceleration in excess of a predetermined value, wherein the improvement comprises:

a partition member disposed within the large diameter portion of said inner bore to subdivide the interior of said valve chamber into front and rear chambers and receiving said valve element at its front face, said partition member being provided at its upper portion with a fluid passage opening around said valve element to provide a fluid communication between said front and rear chambers and being secured in position between the stepped portion of said inner bore and the inner end of said annular protrusion, with its front face abutting said stepped portion; and

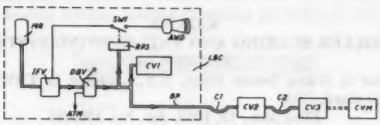
means for locating said partition member in only one predetermined angular relation to said inner bore and for preventing rotation of said partition member relative to said second housing section.

4,319,787

RAIL VEHICLE BRAKING APPARATUS

David J. Wickham, Chippenham, England, assignor to Westinghouse Brake and Signal Co. Limited, Chippenham, England

Filed Feb. 8, 1980, Ser. No. 119,770
Claims priority, application United Kingdom, Feb. 20, 1979, 06026/79
Int. Cl.³ B60T *17/22*
U.S. Cl. 303—86 **5 Claims**



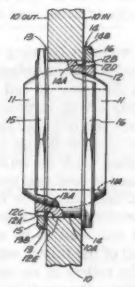
1. A rail vehicle braking apparatus with a brake pipe extending along a train from one vehicle to another vehicle, successive such vehicles having brake control valves for controlling the brakes in response to pressure changes in the brake pipe, brake pipe flow warning means on one vehicle including an increasing fluid flow sensor, and means responsive to sensed increasing fluid flow in the brake pipe for operating a warning device to give a warning of an occurrence of abnormal fluid flow, a pressure-responsive means, operable independently of said fluid flow sensor, which is responsive to changing brake pipe pressure occurring during release of the brakes and inhibiting means operable by the pressure-responsive means to inhibit the warning means for prevention of a warning during such release of the brakes.

4,319,788

MEANS AND TECHNIQUES USEFUL IN MOUNTING SELF-ALIGNING BEARINGS

Kenneth V. Hackman, Arcadia, Calif., assignor to Southwest Products Co., Monrovia, Calif.

Filed Feb. 19, 1980, Ser. No. 122,525
Int. Cl.³ F16C *23/04*
U.S. Cl. 308—72 **11 Claims**



7. A mountable self-aligning bearing assembly for mounting on a mounting structure having a generally cylindrical mounting opening that extends from an outer wall to an inner wall comprising:

a generally spherical inner ball member having an axial bore;

a bearing outer race member having a generally cylindrical outer surface and an inner generally spherical surface conforming with said ball member, said race member having a first end portion and a second end portion for protrusion through said mounting opening beyond said outer and inner walls, said cylindrical outer surface being between said end portions and being slightly smaller in diameter than said mounting opening;

abutment means on one of said end portions for engagement with one of said walls;

a screw threaded portion on the other one of said end portions;

a locking nut threaded on said other end portion and having a flat outer surface;

a notched portion on said other end portion; and

a locking ring between said nut and the other one of said walls and having an inner tab in said notched portion and an outer deformable tab deformed to engage said flat surface of said nut.

4,319,789

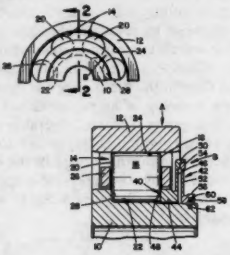
ROLLER BEARING AND ANTI-SKEWING SYSTEM THEREFOR

Arthur S. Irwin, Bemus Point, N.Y., assignor to TRW Inc., Cleveland, Ohio

Filed Mar. 13, 1980, Ser. No. 130,494

Int. Cl.³ F16C *13/00, 33/00, 35/00*

U.S. Cl. 308—207 R **8 Claims**



1. An anti-skewing system for a roller type bearing having a plurality of generally parallel disposed rollers operably interposed between laterally spaced apart means defining first and second bearing races, at least one of said race defining means including a pair of side flanges extending therefrom toward the other of said race defining means with said side flanges being laterally spaced apart from each other to permit said rollers to axially extend therebetween so that opposed ends of said rollers are spaced closely adjacent said side flanges, said system comprising:

a separate flange member defining at least one of said side flanges with said flange member being movable toward and away from the other of said side flanges, said flange member including a wall disposed in sliding engagement with said one race and one wall facing said roller one ends for defining said one side flange; and, urging means operably communicating with an area of said flange member generally opposed to said one wall for urging said flange member toward said other side flange at least when said bearing is operational, said urging means causing said flange member one wall to be moved into engagement with the one end of the rollers which are associated therewith to urge the rollers in an axial direction so that the other ends of the rollers will be moved toward engagement with said other side flange, whereby the relationship thus achieved prevents roller skewing during bearing operation.

4,319,790

WATER LUBRICATED SLEEVE BEARINGS

George A. Thomson, 875 Warwick Ave., Burlington, Ontario, Canada (L7T 3Y4)

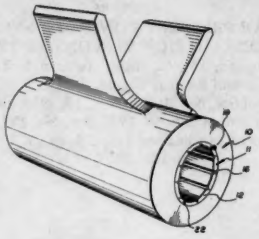
Filed Jul. 5, 1978, Ser. No. 922,055

Claims priority, application Canada, Jul. 7, 1977, 282244

Int. Cl.³ F16C *27/02, 33/20*

U.S. Cl. 308—238 **2 Claims**

1. A sleeve bearing for mounting in a cylindrical housing bore by means of an interference fit, said bearing consisting entirely of a single homogeneous solid, hard elastomeric urethane polymer having a Shore D hardness of at least 60, a compressive modulus of elasticity at a 4% compressive strain of at least 50,000 psi and a dry dynamic co-efficient of friction against steel of no more than 0.20, said bearing comprising a plurality of arcuate segments together forming a sleeve machined to fit within a cylindrical housing bore by means of a forced interference fit providing sufficient outward radial force by the outer surface of the segments on the housing to retain the segments in movement-free fit during the operational life of the bearing, said forced interference fit being the sole means of retaining the bearing within the housing.



4,319,791

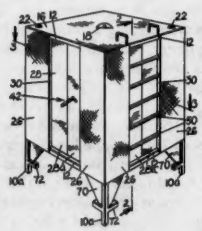
PROTECTIVE CAGE FOR EXCAVATION WORKERS

Van A. Gibson, 6510 SE. Jack Rd., Milwaukie, Oreg. 97222

Filed Jun. 4, 1979, Ser. No. 44,921

Int. Cl.³ A45F *3/44;* E21D *5/12;* F16M *13/00*

U.S. Cl. 312—239 **3 Claims**



1. A protective cage for excavation workers comprising

(a) a box-like housing having defining side walls therearound and a top wall all arranged to provide an interior which serves as an enclosed protective area for a worker in the housing from cave-ins or the like in an excavation,

(b) said housing having an open bottom portion to provide a digging area under said housing interior when said housing is seated on the ground in an excavation,

(c) a plurality of legs on said houing extending downwardly below the bottom thereof,

(d) a flat ground engaging portion on each of said legs spaced below the bottom of said housing for supporting said housing on supporting ground with the bottom thereof spaced above the supporting ground to allow a worker to dig under as well as out beyond the sides of said housing,

(e) extensions on said legs projecting below said ground engaging portions arranged to pierce the ground and anchor said housing against lateral movement,

(f) at least two door means spaced around said defining side walls and hinged for inward movement,

(g) releasable safety chain means extending across said door

means interiorly of said housing to hold said door means shut in the event of a cave-in,

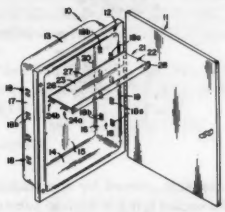
(h) and a lift connection on the upper portion of said housing for moving said housing into and out of as well as within an excavation by a powered lifting device.

4,319,792

SHELF STRUCTURE

Ronald L. Britt, Middletown, Ohio, and Delmar E. Benjamin, Kent, Wash., assignors to The Celotex Corporation, Tampa, Fla.

Filed Mar. 31, 1980, Ser. No. 135,371
Int. Cl.³ A47B *67/02, 45/00*
U.S. Cl. 312—245 **10 Claims**



1. An integral plastic shelf structure comprising a shelf body having a pair of spaced gripping and strengthening projections which extend longitudinally from one side edge to the other along the undersurface of said shelf body, each of said gripping and strengthening projections extending downwardly a short distance from said undersurface of said shelf body and then rearwardly away from the front longitudinal edge of said shelf body for a short distance and being adapted to lockingly engage with two opposed side wall projections to thereby support said shelf structure, and two protrusions which extend longitudinally from one side edge to the other along said undersurface of said shelf body, one of said protrusions being located above each of the rearwardly extending portions of said gripping and strengthening projections.

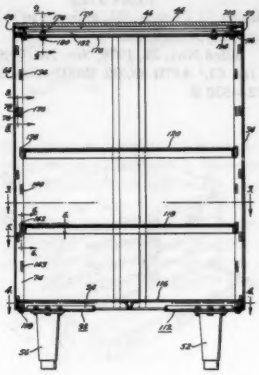
4,319,793

SHEET METAL CABINET

J. Marshall Suttles, Elberton, Ga., assignor to Royston Manufacturing Corporation, Royston, Ga.

Division of Ser. No. 52,114, Jun. 26, 1979. This application Jul. 14, 1980, Ser. No. 167,928
Int. Cl.³ A47B *43/00, 87/00*
U.S. Cl. 312—257 R **13 Claims**

1. A sheet metal cabinet having four vertical walls comprising a front wall, two side walls extending perpendicularly from the front wall in the rearward direction, and a rear wall extending from one side wall to the other side wall in perpendicular relation to the side walls and spaced rearwardly from the front wall, the intersections of adjacent walls forming corners of the cabinet and each wall having a pair of vertical edges located at corners of the cabinet, said walls comprising a first sheet metal element forming at least part of the front wall and having integral, rearwardly extending side portions extending perpendicularly from the opposite vertical edges of the front wall, each rearwardly extending side portion forming a part of a side wall of the cabinet; a second sheet metal element forming at least part of the rear wall and having integral, forwardly extending side portions extending perpendicularly from the opposite vertical edges of the rear wall, each forwardly extending side portion forming a part of a side wall of the cabinet; a third sheet metal element forming part of a side wall of the cabinet and extending from one side portion of the first element to the side portion of the second element on the same side of the cabinet, said third element meeting the side portions between which it extends along vertical lines, a fourth sheet metal element forming part of a side wall of the cabinet and extending from the other side portion of the first element to the side portion of the second element at the same side of the cabinet, said fourth sheet metal element meeting the side portions between which it extends along vertical lines; each of said side portions having an integral flange extending inwardly in a vertical plane perpendicular to the side walls, and located adjacent the vertical lines at which it meets an edge of said third and fourth elements; each of said third and fourth elements having integral flanges extending inwardly in vertical



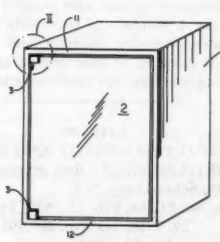
planes perpendicular to the side walls and located adjacent the vertical line at which it meets the side portion of the first and second element, the flanges of the element meeting at said vertical lines being in abutment and being secured together by connecting means comprising a series of interengaging slots and tabs, the tabs on any given flange extending vertically in the same direction whereby connection of the abutting flanges is accomplished by horizontal movement of the tabs into the slots followed by relative vertical movement of the abutting elements.

4,319,794

CABINET WITH A DETACHABLE DOOR

Jürgen Bachor, Kirchlengern, Fed. Rep. of Germany, assignor to Paul Hettich & Co., Kirchlengern, Fed. Rep. of Germany

Filed May 13, 1980, Ser. No. 150,406
Claims priority, application Fed. Rep. of Germany, May 17, 1979, 7914232[U]
Int. Cl.³ A47B *81/00*; E05D *15/00*
U.S. Cl. 312—293 **4 Claims**



1. A cabinet with a door, particularly a glass door, comprising a cabinet body; a door; a receiving pocket part securably attached to said door; a hinge post having an upper end and a lower end, said lower end being attached to said receiving pocket part; and a bushing part mounted on said cabinet body

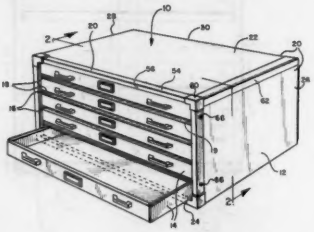
and operative for receiving said upper end of said hinge post so that said post may rotate, said bushing part including a bushing and locking means for securing said hinge post; said locking means including two opposite elastic members having locking projections, said hinge post being formed with an annular groove in the vicinity of its upper end, said hinge post abutting against said bushing, and said locking projections engaging said groove.

4,319,795

FLAT FILE

Gerald R. Klaus, St. Charles, Ill., assignor to Fellowes Manufacturing Company, Itasca, Ill.

Filed Nov. 29, 1979, Ser. No. 98,639
Int. Cl.³ A47B *88/00*; B65D *6/00, 57/00*
U.S. Cl. 312—330 R **9 Claims**



1. A storage unit comprising in combination:
a housing including at least a fiberboard top wall, a fiberboard bottom wall and two opposed fiberboard side walls, with each wall having a forward edge cooperating to define an open front end for the housing, said housing being formed of a first and a second fiberboard blank, said first blank being scored and folded at boundaries defining one of said side walls, said top wall, and a first layer of said rear wall, said second blank defining the other of said side walls, said bottom wall, and a second layer of said rear wall, said blanks being joined at corners between said top and bottom walls and said side walls, and said layers of said rear wall being adhered together;
a particle board panel positioned inside of each side wall adjacent the forward edge thereof;
a rearwardly extending groove provided in each of said particle board panels and defining aligned upper and lower internal shoulders;
a fiberboard shelf having a forward edge and including a relatively rigid channelled casing receiving said forward edge;
said shelf and said channelled casing being firmly supported within said grooves between said aligned upper and lower internal shoulders so that said particle boards, shelf and casing define a plurality of accurately spaced and maintained drawer-receiving openings; and
a plurality of drawers, at least one of said drawers being slidably supported on said shelf and casing.

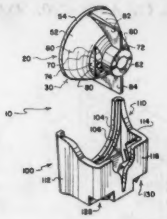
4,319,796

COMPACT LAMP UNIT AND SOCKET

Emmett H. Wiley, Chesterland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 11,344, Feb. 12, 1979. This application Oct. 29, 1980, Ser. No. 201,793
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—65 **9 Claims**

1. A socket into which a lamp unit can be inserted, the socket adapted to locate the lamp unit with respect to a predetermined optical axis, comprising:
(a) first structure against which a portion of the lamp unit is engaged in use, the first structure providing a reference plane disposed in a predetermined orientation with respect to the optical axis;
(b) second structure spaced from the first structure, the second structure adapted to engage another portion of the lamp unit, the lamp unit thereby being rigidly secured with respect to the reference plane upon being disposed between the first and second structures;
(c) electrical contacts carried by the lamp unit, the contacts disposed substantially flush with the outer surface of the lamp unit and lying in a plane substantially parallel with the first and second structures;



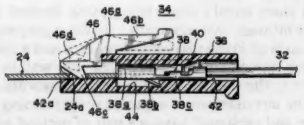
(d) electrical contacts carried by the socket, the contacts carried by the socket lying in a plane substantially parallel with the reference plane and engaging the electrical contacts carried by the lamp unit, and
(e) guide means comprising a slot in at least one of said first and second structures and aligned with the path the lamp unit traverses as it is inserted into the socket, said slot being engageable by a projecting portion included as part of the lamp unit so as to orient the lamp unit into a desired angular position about the optical axis upon insertion into the socket.

4,319,797

ELECTRICAL CONNECTOR WITH TERMINAL LOCKING MEANS

Shuichi Otani, Tokyo; Shinichi Kato, Fujisawa; Susumu Hashimoto, Kitakawabe, and Kyohichi Itoh, Ichinoseki, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 13, 1980, Ser. No. 130,068
Claims priority, application Japan, Mar. 20, 1979, 54-36093[U]
Int. Cl.³ H01R *13/629*
U.S. Cl. 339—75 R **5 Claims**



1. An electrical connector comprising:
an insulating housing having therein a through passage;
a female terminal received and locked in said passage of said housing, said female terminal having a female mating section;
a male terminal having a male mating section, said male mating section being engageable with said female mating section of said female terminal to achieve electrical connection therebetween upon insertion of said male terminal into said housing; and
locking means for providing locking connection between said male and female terminals upon engagement of said male and female mating sections,

wherein said locking means comprises:

an opening formed in said male mating section of said male terminal; and

a locking arm united at its generally middle section with the outer surface of said housing and having a hook portion at one longitudinal end and a handle portion which extends outwardly from the generally middle section in a direction opposite to said hook portion, said locking arm being biased to pivot in a given direction whereby upon insertion of said male terminal into said housing, said hook portion is forced to engage with said opening of said male terminal thereby completing the locking connection between said male and female terminals.

4,319,798

PLUG-IN CONNECTOR FOR USE WITH ELECTRICAL SOCKETS IN MOTOR VEHICLES

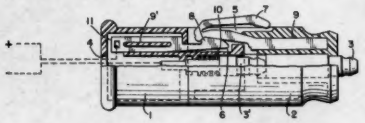
Bernhard Mittelhäuser, No. 57, D-3002 Wedemark 2, Fed. Rep. of Germany

Filed Feb. 14, 1980, Ser. No. 121,641

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1979, 7904164[U]

Int. Cl.³ H01R *17/00*

U.S. Cl. 339—154 R **1 Claim**



1. A tandem-type plug-in connector, for use with electrical sockets in motor vehicles, which comprises:

a first section and a second section each independently usable as plugs as well as both usable when unified, said first and second sections of the tandem-type plug-in connector being capable of being connected; and

an external contact respectively provided for each of said sections, one end of each of said external contacts being embedded in its pertaining section, the other end of each of said contacts being a free end adapted to be shifted radially with respect to its pertaining section, said external contacts being capable of engaging one another to effect connection of said first and second sections and electrical connection between said external contacts, with said external contact of said first section being arranged radially outwardly of said external contact of said second section in the position of connection of said first and second sections, said free end of said external contact of said second section being curved to form a hook shape that is capable of positively engaging said external contact of said first section, said external contact of said second section being shifted inwardly in a radial direction upon application of radially exerted pressure on said external contact of said first section, said first and second sections each having a center contact, one end of one of said center contacts being adapted to resiliently abut against one end of the other of said center contacts when assembled.

4,319,799

ELECTRICAL CONNECTOR WITH GROUP TERMINAL LOCK

Warren Pearce, Jr., Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 11, 1980, Ser. No. 139,262

Int. Cl.³ H01R *13/40*

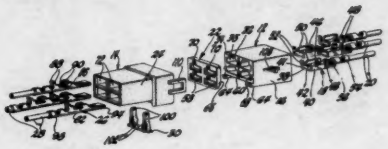
U.S. Cl. 339—217 R **4 Claims**

1. An electrical connector having a group terminal lock comprising:

a connector body having a mating end and a plurality of terminal cavities extending therethrough which define a pattern of openings at the mating end of the connector body,

a plurality of terminals disposed in the terminal cavities, said terminals having contact portions and projecting hooks at one end which hooks extend through the openings at the mating end, and

a lock plate attached to the connector body at the mating end,



said lock plate having a plurality of holes which have a pattern corresponding to that of the openings at the mating end of the connector body and which are aligned with respective contact portions of the terminals for guiding mating terminals into engagement therewith, and

said lock plate having portions adjacent the holes which partially block the openings and which are disposed behind the hooks to lock the plurality of terminals in the connector body as a group.

4,319,800

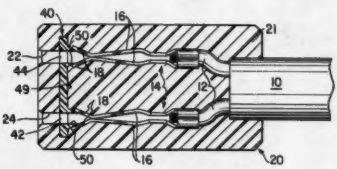
BARRIER FOR MOLDED FEMALE POWER CORD CONNECTOR BODIES

Charles A. Bernat, Jewett City, Conn., assignor to Triangle PWC, Inc., New Brunswick, N.J.

Filed Mar. 7, 1980, Ser. No. 128,165

Int. Cl.³ H01R *4/24*

U.S. Cl. 339—218 R **9 Claims**



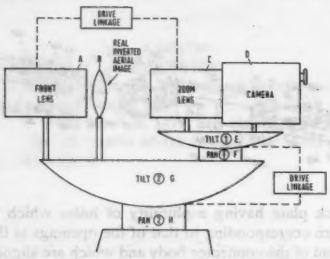
1. In a rigid dielectric barrier adapted for incorporation in a front portion of a molded female electrical connector for preventing improper insertion of a prong of a complementary male connector into said female connector, said female connector including a plurality of female contact members, each of said contact members corresponding to one of said prongs and having a front portion adapted to accept its corresponding prong, and said barrier having a passage corresponding to the front portion of each said female contact member and adapted to be aligned therewith, each said passage being dimensioned to closely accept the corresponding prong for allowing said corresponding prong to be inserted into the front portion of said corresponding female contact member, the improvement comprising:

a protrusion adjacent an edge of each said passage adapted for being placed in contact with an interior surface of the front portion of said corresponding female contact member prior to and during the molding of said female connector for preventing molding compound from seeping into contact with said interior surface.

4,319,801
IMAGE RECORDING SYSTEM

Peter F. Versey, 66 Campbell Rd., Twickenham, England

Filed Jul. 16, 1979, Ser. No. 57,686
Int. Cl.[3] G02B 27/00; G03B 15/08
U.S. Cl. 350—19 11 Claims

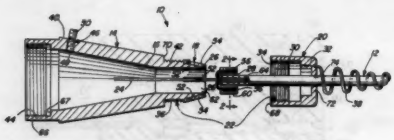


1. A method of recording visual images of a three-dimensional subject against a background, comprising using a first lens system to produce a first image of the subject, using a second lens system to produce a second image from the first image, adjusting the position of the second image by movement of the second lens system relative to the first lens system, and recording the second image only.

4,319,802
STAIN RELIEF FOR FIBER OPTIC CONNECTORS

Kenneth F. Bowes, Danbury, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 17, 1979, Ser. No. 86,199
Int. Cl.[3] G02B 7/26
U.S. Cl. 350—96.20 39 Claims



1. A device for providing strain relief for a fiber optic cable having an optical fiber terminated in a fiber optic connector, comprising:

a body including a forward portion and a rearward portion, said rearward portion including means for securing said fiber optic cable against rearward movement, said body having a cable receiving opening extending therethrough;

said cable securing means being movable radially between an operative position and an inoperative position;

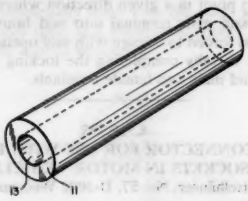
means for gripping and holding said fiber optic cable independently of said securing means, said gripping means cooperating with said cable securing means in said operative position to provide strain relief for said fiber optic cable; and

means for moving said cable securing means between said inoperative position and said operative position, said rearward portion of said body and said moving means including means independent of said cable securing means for maintaining said cable securing means in said operative position cooperating with said gripping means to provide said strain relief for the cable, said moving means having a cable receiving opening extending therethrough.

4,319,803
OPTICAL FIBER COATING

Robert A. Burmeister, Saratoga; Paul E. Greene, Los Altos, and Ronald Hiskes, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 24, 1978, Ser. No. 963,253
Int. Cl.[3] G02B 5/172
U.S. Cl. 350—96.33 8 Claims



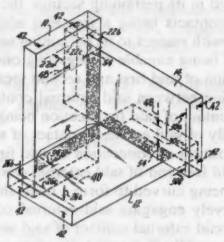
7. An optical fiber coated with a hermetic material consisting essentially of silicon, nitrogen and oxygen.

8. An optical fiber coated with a hermetic material consisting essentially of boron, nitrogen, and oxygen.

4,319,804
ADJUSTABLE HOLLOW RETROFLECTOR

Morton S. Lipkins, 3 Nemeth St., Malverne, N.Y. 11565

Filed Sep. 17, 1980, Ser. No. 188,041
Int. Cl.[3] G02B 5/122
U.S. Cl. 350—102 16 Claims



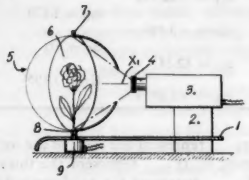
1. An adjustable retroreflector, including three adjustable plates having broad opposite surfaces, each of said plates fixedly bearing an optically flat front reflecting surface, said plates and said reflecting surfaces borne thereby being disposed to form a hollow reflecting corner-cube, a rigid supporting base, means carried by said base for securing said plates to said base, said securing means including, for each plate, means cooperating with opposite broad surfaces of first portions of the related one of said plates for establishing a pivotal axis therefor, the axis of each plate being parallel to or on the reflecting surface thereof and being essentially perpendicular to a respective one of three orthogonal reference planes, and said securing means including adjustable means cooperating with the opposite broad surfaces of a respective portion of each of said plates remote from said first portions thereof for securing said plates firmly in positions that are adjustable about said axes.

4,319,805

ROTARY SCREEN FOR RECEIVING OPTICAL IMAGES PARTICULARLY ADVERTISING IMAGES

Pierre Nicolas, 30, rue Lamartine, 91100 Corbeil-Essonnes, France

Filed Feb. 4, 1980, Ser. No. 118,572
Claims priority, application France, Feb. 6, 1979, 79 03002
Int. Cl.³ G03B *21/56*; G09F *13/00*; G03B *21/24*
U.S. Cl. 350—120 5 Claims



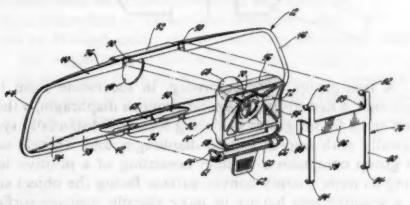
1. A rotary screen for receiving optical images provided by a projector, said screen being a translucent screen rotatable on itself and mounted in median area of a spherical enclosure having a rear face and a front face, said rear face being opaque except in a central transparent portion and said front face being transparent, the projector being mounted rearwardly of said spherical enclosure in center axis of said rear face transparent portion in order to enable light rays from the projector to pass through said transparent portion of said spherical enclosure rear face to reach the screen.

4,319,806

ANTIGLARE REAR VIEW MIRROR

Darrell L. Brandenburg, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 11, 1980, Ser. No. 167,414
Int. Cl.³ B60R *1/04*
U.S. Cl. 350—281 2 Claims



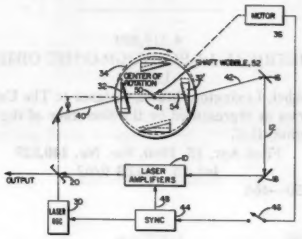
1. An anti-glare rear view mirror comprising a housing which supports a mirror element having two reflecting surfaces of different reflecting powers, said housing including a back wall integrally formed with forwardly extending upper and lower flange members each of which has an elongated well formed therein, said back wall having a first aperture formed therein, a second aperture formed in said well in the lower flange member, a support extending through said first aperture into the interior of said housing, an actuator assembly in said housing including a body portion made of a plastic material and rigidly connected to one end of said support, said body portion having a bearing surface formed at the upper end thereof located in said well in said upper flange member for allowing said housing to pivot about a first horizontal axis relative to said body portion, an elongated cylindrical member located in said well in said lower flange member for rotation about a second horizontal axis and being formed with a tab member which extends through the second aperture and is accessible for manual movement between first and second positions, a flexible hinge connecting the lower end of said body portion to said cylindrical member whereby movement of said tab member between said first and second positions causes said cylindrical member to rotate about said second horizontal axis with resultant pivotal movement of said housing about said first horizontal axis so as to present one or the other of said reflecting surfaces to the viewer, and means connecting said upper flange member to said lower flange member so as to draw said flange members towards each other and thereby apply a preload to said body portion and said cylindrical member at said flexible hinge to ensure that said housing maintains its position when placed in said first position or in said second position.

4,319,807

ROTATING OPTICAL FREQUENCY CHIRP DEVICE

James A. Horton, Kennewick, Wash., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Mar. 24, 1980, Ser. No. 133,406
Int. Cl.³ G02B *27/17*
U.S. Cl. 350—6.4 33 Claims



1. A system for providing electromagnetic radiation of time varying frequency comprising:

a source of electromagnetic radiation of substantially fixed frequency;

means for directing the radiation from said source along a path;

a material of varying thickness having an index of refraction different from that of the surrounding environment, at least a portion of the material being wedge-shaped;

a support;

means for orienting said material on said support such that the angle of incidence that said path makes with a surface of said material is such that the half angle and the center line of the wedge-shaped portion coincide, whereby said system operates at the point of minimum deviation; and,

means for moving said support such that said material moves transversely across said path for varying as a function of time the length of said path and thus the speed of propogation of said electromagnetic radiation along said path.

4,319,808

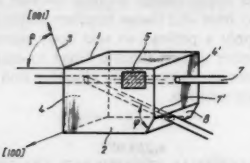
COMBINED ACOUSTO-OPTIC DEVICE FROM OPTICALLY BIREFRINGENT CRYSTAL

Cestmir Barta; Jiri Ctyroky, both of Prague, Czechoslovakia; Iraida M. Silvestrova, and Jurij V. Pisarevskij, both of Moscow, U.S.S.R., assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia and Akademia nauk SSSR, Moscow, U.S.S.R.

Filed Apr. 8, 1980, Ser. No. 138,858
Claims priority, application Czechoslovakia, Apr. 13, 1979, 2544-79
Int. Cl.³ G02F *1/33*
U.S. Cl. 350—358 7 Claims

1. An acousto-optic device comprising an optically birefringent crystal, consisting of the single crystal cut to have at least a first face parallel to the direction of the principal crystallographic axis, provided with at least one piezoelectric source of acoustic waves and a pair of opposed second faces having an

entrance for light normal thereto and an exit for the ordinary and extraordinary light beam inclined from the direction [001] of the principal crystallographic axis by an angle



$$\rho = \text{arc tg } (n_e/n_o) \pm 20°$$

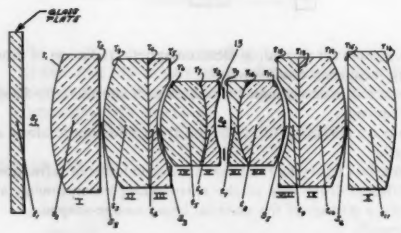
where n_o is the refractive index for the ordinary light beam and n_e the refractive index for the extraordinary light beam.

4,319,809

SYMMETRICAL 1:1 PHOTOGRAPHIC OBJECTIVE LENS

Irving R. Abel, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 15, 1980, Ser. No. 140,529
Int. Cl.³ G02B 9/62
U.S. Cl. 350—464 **1 Claim**



1. A photographic objective lens constructed substantially in accordance with the following data:

Element	f = 100 Radii	Thickness and Separation	f/2.5 N_d	V_d
	plano			
Glass Plate		t_1 = .30	1.51680	64.17
	plano	S_1 = 9.740		
	r_1 = 5.6335			
I		t_2 = 1.195	1.65160	58.52
	r_2 = −42.35			
		S_2 = .05		
	r_3 = 3.4850			
II		t_3 = 1.175	1.65160	58.52
	r_4 = 22.772			
III		t_4 = .25	1.61340	44.30
	r_5 = 2.0797			
		S_3 = .12		
	r_6 = 3.1449			
IV		t_5 = 1.057	1.62041	60.33
	r_7 = −3.3260			
		t_6 = .25	1.61340	44.30
	r_8 = 3.0877			
STOP		S_4 = .189		
	r_9 = −3.0877			
VI		t_7 = .25	1.61340	44.30
	r_{10} = 3.3260			
VII		t_8 = 1.057	1.62041	60.33

-continued

Element	f = 100 Radii	Thickness and Separation	f/2.5 N_d	V_d
	r_{11} = −3.1449			
		S_5 = .12		
	r_{12} = −2.0797			
VIII		t_9 = .25	1.61340	44.30
	r_{13} = −22.772			
IX		t_{10} = 1.175	1.65160	58.52
	r_{14} = −3.480			
		S_6 = .05		
	r_{15} = 42.35			
X		t_{11} = 1.195	1.65160	58.52
	r_{16} = −5.6335			

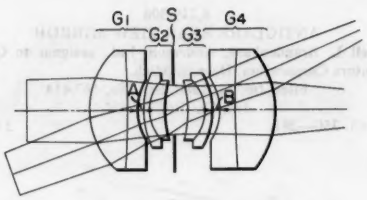
wherein r_1, r_2 . . . represent the radii of the individual surfaces of the elements, t_1, t_2 . . . represent the thickness of the elements, S_1, S_2 . . . represent the axial separation between the elements, N_d is the index of refraction for the sodium D line and V_d is the Abbe number.

4,319,810

FOUR-GROUP LENS

Ikuo Mori, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 18, 1979, Ser. No. 104,842
Claims priority, application Japan, Dec. 29, 1978, 53-163081
Int. Cl.³ G02B 9/34
U.S. Cl. 350—469 **4 Claims**



1. A four-group lens comprising, in succession from the object side, a first group, a second group, a diaphragm, a third group and a fourth group and being formed substantially symmetrically with respect to said diaphragm, and wherein said first group comprises a doublet consisting of a positive lens having its more sharply convex surface facing the object side and a negative lens having its more sharply concave surface facing the image side, said second group comprises a doublet or a single meniscus lens having its convex surface facing the object side, said third group comprises a doublet or a single meniscus lens having its convex surface facing the image side, said second group comprises a doublet consisting of a negative lens having its more sharply concave surface facing the object side and a positive lens having its more sharply convex surface facing the image side, the improvement residing in that said first and fourth groups are movable integrally in the direction of the optic axis with respect to said second and third groups in such a manner that when magnification is greater than the design standard the spacing between the first and the second group is greater while at the same time the spacing between the third and the fourth group is smaller maintaining the sum of the spacing between the first and the second group and the spacing between the third and the fourth group constant, and when magnification is smaller than the design standard the spacing between the first and the second group is smaller while at the same time the spacing between the third and the fourth group is greater maintaining the sum of the spacing between the first and the second group and the spacing between the third and the fourth group constant.

4,319,811
ABRASION RESISTANCE RADIATION CURABLE COATING

Shu-Tung Tu, East Brunswick, and Donald H. Lorenz, Basking Ridge, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,200
Int. Cl.³ G02C *7/02*; B32B *27/30*
U.S. Cl. 351—166 **26 Claims**

1. A substantially oligomer-free stable, substantially only radiation curable coating composition comprising a mixture of radiation polymerizable monomers consisting essentially of:

(a) a triacrylate or tetracrylate monomer; and

(b) an N-vinyl imido group containing monomer; wherein the weight ratio of acrylate monomer to vinyl monomer is in the range of from about 1 to about 10 to 1, monomer (b) being present in a quantity sufficient to produce a composition having a viscosity substantially less then that of monomer (a).

15. A pair of eyeglasses, having a frame and lenses, said lenses being formed of a material selected from the group consisting of cellulose acetate, cellulose acetate butyrate, cellulose acetate propionate, polycarbonate, polystyrene, methyl methacrylate, and styrene-methyl methacrylate copolymers and a coating on said material, said coating being the radiation cured product of an oligomer-free mixture of radiation polymerizable monomers consisting essentially of:

(a) a triacrylate or tetracrylate monomer; and

(b) an N-vinyl imido group containing monomer; wherein the weight ratio of acrylate monomer to vinyl monomer is in the range from about 1 to about 10 to 1, monomer (b) being present in a sufficient quantity to produce a composition having a viscosity substantially less than that of monomer (a).

17. A laminate structure comprising a substrate and a coating on said substrate, said coating being the reaction product of the radiation curing of a substantially oligomer-free radiation curable coating composition comprising a mixture of radiation polymerizable monomers consisting essentially of:

(a) a triacrylate or tetracrylate monomer; and

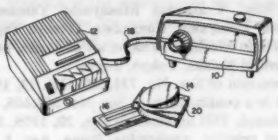
(b) an N-vinyl imido group containing monomer; wherein the weight ratio of acrylate monomer to vinyl monomer is in the range from about 1 to about 10 to 1, monomer (b) being present in a sufficient quantity to produce a composition having a viscosity substantially less than that of monomer (a).

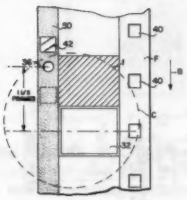
4,319,812
AUDIO-VISUAL SYSTEMS AND METHODS

Albert M. Williams, Los Angeles, Calif., assignor to Technicolor Corporation, Hollywood, Calif.

Filed Mar. 8, 1976, Ser. No. 665,097
Int. Cl.³ G03B *31/04*
U.S. Cl. 352—31 **32 Claims**

1. A projector for advancing and projecting motion picture film having optical stop cues thereon, said projector having a picture aperture and a cueing port and means for illuminating said aperture and said port, the picture aperture being arranged for alignment with successive frames of said film, and the cueing port being arranged to be passed by said cues, the center of said cueing port being located a distance of about one and one third frame lengths from the transverse center line of the picture aperture, means for detecting moving cues passing said cueing port, and means responsive to a detected moving



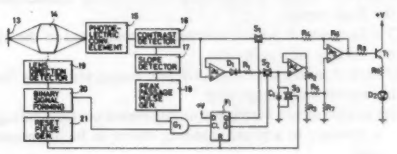


cue for stopping advancement of film in said projector so that a corresponding frame is aligned with the picture aperture.

4,319,813
AUTOMATIC FOCUS INDICATING DEVICE FOR CAMERA

Harumi Aoki, Kiyose, and Yoshio Sawada, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1980, Ser. No. 118,889
Claims priority, application Japan, Feb. 19, 1979, 54/18574
Int. Cl.³ G03B *7/081, 3/10*
U.S. Cl. 354—25 **8 Claims**



1. A device for detecting a focus position and for providing an automatic focus indication in a camera comprising: means for providing a contrast signal from the image of an object to be photographed; a lens direction detector for detecting the direction of movement of a lens; a peak hold circuit for storing the maximum value of said contrast signal; an attenuator for reducing said value; a reset pulse generating circuit operating in response to said lens direction detector for generating a reset pulse to reset contents stored in said peak hold circuit; a difference circuit for providing a signal representing a difference between the reduced stored maximum value and said contrast signal; control circuit means operating in response to said contrast signal, said lens direction detector and said reset pulse generating circuit for producing a focus signal in proportion to an output of said difference circuit when said contrast signal is greater than said reduced stored maximum value with said lens moving in the same direction as that when said stored maximum value was stored; and means for producing an indication in response to said focus signal substantially at the point of focus.

4,319,814

CAMERA EMPLOYING A FLASH ILLUMINATION DEVICE AND A FLASH PHOTOGRAPHING SYSTEM

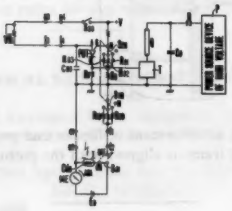
Yukio Iura, Yokosuka; Masayoshi Yamamichi, Kanagawa; Takashi Uchiyama, Kanagawa; Tetsuya Taguchi, Kanagawa, and Yukio Mashimo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 731,225, Oct. 12, 1976, abandoned, which is a continuation of Ser. No. 563,446, Mar. 31, 1975, abandoned. This application Jun. 20, 1979, Ser. No. 50,325

Claims priority, application Japan, Apr. 1, 1974, 49-36793; Apr. 1, 1975, 50-36794

Int. Cl.[3] G03B *7/085, 15/05*

U.S. Cl. 354—33 18 Claims



1. For use in combination with a camera having aperture control means as well as synchronizing terminal means and exposure aperture signal input terminal means, a flash device comprising:

(A) flash means for emitting a light,

(B) electric energy storing means electrically connected to the flash means,

(C) a flash power source electrically connected to the electric energy storing means,

(D) flash stopping means electrically connected to the flashing means and comprising:

(a) circuit means forming a timing signal corresponding to a distance to a photographing object to be illuminated, and

(b) switching means connected to the flash means and operative in response to receiving at least the timing signal from the circuit means to stop the emission of light by the flash means,

(E) exposure aperture signal forming means forming an electric signal corresponding to a designated diaphragm aperture which achieves optimum exposure according to the amount of light emitted by the flashing means, and

(F) output terminal means electrically connected to the exposure aperture signal forming means and connectable to the signal input terminal means on the camera when the flash device is used in combination with the camera,

said exposure aperture signal forming means being adapted to be coupled to the aperture control means when the flash device is electrically coupled to the camera for impressing an exposure aperture designation signal formed by the aperture signal forming means on the aperture control means to adjust the camera exposure aperture value for flash operation,

the amount of light emitted by the flash device being adjusted to a value according to a distance to an object.

4,319,815

PRISM VIEW FINDER FOR REFLEX CAMERAS WITH BUILT-IN EXPOSURE METER

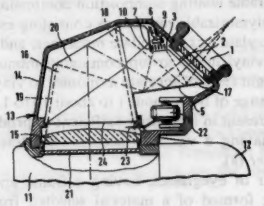
Ferdinand Kellner, Spittelmüllerstr. 6, 8940 Memmingen, Fed. Rep. of Germany

Filed Nov. 12, 1980, Ser. No. 205,946

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1979, 2946905

Int. Cl.[3] G03B *7/00, 19/12, 13/08*

U.S. Cl. 354—59 5 Claims



1. In a prism view finder for reflex cameras of the type having a casing including an opening for receiving the image of a subject, an eyepiece mounted in said casing with its optical axis disposed at approximately 45° to the optical axis of said opening, and a prism mounted in said casing adjacent said opening, said prism having a bevel face opposite said opening for receiving the image from said opening and a plane mirror face for receiving the image from said bevel face and reflecting it through a beam emergent face of said prism to said eyepiece at an inclination of approximately 45° to the direction of original incidence on the prism, the improvement comprising exposure metering means for measuring the integral exposure value of the image including an additional plane face on said prism substantially parallel to said plane mirror face, and light sensitive means adjacent said eyepiece and opposite said plane mirror surface for measuring the brightness of the plane mirror surface through said additional plane face.

4,319,816

PRISM VIEWFINDER FOR REFLEX CAMERAS WITH BUILT-IN LIGHT METER

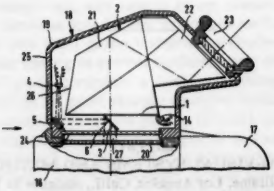
Ferdinand Kellner, Spittelmüllerstr. 6, D-8940 Memmingen, Fed. Rep. of Germany

Filed Dec. 12, 1980, Ser. No. 216,005

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952207

Int. Cl.[3] G03B *7/099*

U.S. Cl. 354—56 10 Claims



1. In a prism viewfinder for mirror reflex cameras having an arrangement for selective light measurement wherein a housing has mounted therein a compound prism which has a bevel edge opposite to its beam-incidence surface and a plane reflecting surface associated with said edge, and wherein said reflecting surface directs the path of a beam leaving said prism at about a 45° angle to its incidence direction, the improvement comprising:

a partially transmitting reflecting means comprising a partially transmitting mirrored surface mounted within the housing in the region of the beam-incidence surface of the

prism at an angle such that the incident light beam and the reflected light beam are at an angle to each other somewhat greater than 90°; and

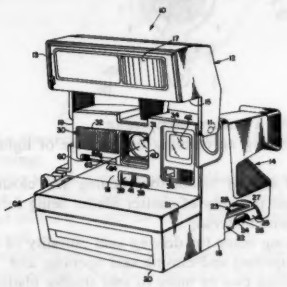
light sensing means mounted within the housing and adjacent to the prism disposed so that the reflected light beam impinges on said light sensing means.

4,319,817

CAMERA HAVING BUILT-IN, CLOSE-UP LENS

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 11, 1980, Ser. No. 215,235
Int. Cl.³ G03B *15/03*
U.S. Cl. 354—127 **8 Claims**



1. Photographic camera apparatus comprising:

a camera housing including means for facilitating the mounting of film in a plane for photoexposure and for defining a light path along which scene light can travel to said film mounting plane;

an objective taking lens mounted within said camera housing in registration with said light path and structured for directing scene light onto film located in said camera film plane;

a foldable flash unit mounted on said camera housing for movement between an operative erect position and a folded storage position;

a supplementary lens structured for use with said objective taking lens so that the two in combination can focus on objects closer than would otherwise be possible with said objective taking lens acting alone; and

means for mounting said supplementary lens for movement between a storage location in which said supplementary lens is not registered with said objective taking lens and an operative location in which said supplementary lens is in optical registration with said objective taking lens, said mounting means being structured so that said supplementary lens can be manually moved from its storage location to its operative location and thereafter either can be manually released, or released in response to the movement of said flash unit into its folded position, to automatically return to its storage location.

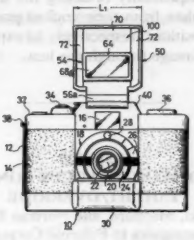
4,319,818

PHOTOGRAPHIC CAMERA

Kenji Sawara, Tokyo, Japan, assignor to Fuji Koeki Corporation, Tokyo, Japan

Filed Jul. 30, 1980, Ser. No. 173,717
Claims priority, application Japan, Jul. 30, 1979, 54/105167[U]
Int. Cl.³ G03B *15/03, 15/02*
U.S. Cl. 354—145 **10 Claims**

1. A photographic camera comprising a camera unit including a housing which can be sealed to form a light-tight enclosure, a light receiving member for receiving light reflected from an object to be photographed and including a lens and a shutter release member for actuating opening and closing operations of said light receiving member, said light receiving member and said shutter release member being incorporated in said housing, and a flash unit including a casing pivotably mounted on said housing of the camera unit by a connecting member and a flash member for producing a flash light and provided in said casing spaced at predetermined distance from



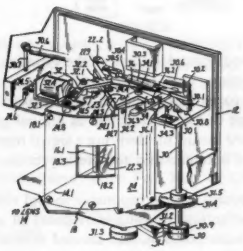
said connecting member, said casing of the flash unit being formed so as to cover said light receiving member of said camera unit, said connecting member comprising position arresting means for arresting the rotation of said flash unit in at least two positions, and said casing of the flash unit having means for performing a shutter locking operation when said casing is closed.

4,319,819

REFLEX SHUTTER

Jerome W. Lindenfelser, Brooklyn Park, Minn., assignor to Photo Control Corporation, Crystal, Minn.

Filed Feb. 14, 1980, Ser. No. 121,385
Int. Cl.³ G03B *19/12*
U.S. Cl. 354—154 **4 Claims**



1. In a photographic camera having a housing bearing an objective lens, a viewfinder and a film plane within the housing disposed on the optical path through the lens:

shutter means for momentarily exposing the film plane to a light image from the lens and comprising

an arcuate, stationary shutter plate having an aperture therethrough aligned with the optical path, the arcuate shutter plate having a generally concave surface confronting the film plane and a generally convex surface confronting the objective lens;

a mirror support bearing a mirror and mounted to the housing but swingable along but spaced from the generally concave surface of the arcuate shutter plate between cocked and uncocked positions, the mirror support in its cocked position positioning the mirror between the aperture and the film plane to mask the film plane from the lens, and unmasking the film plane from the lens as the mirror support swings toward its uncocked position;

an arcuate masking plate mounted to the housing and having an inner generally concave surface confronting the exterior, generally convex surface of the shutter plate, the masking plate being swingable between a cocked position out of alignment with the optical path and an uncocked position masking the aperture from the lens; and

means for sequentially releasing the mirror support and masking plate from their cocked positions to their uncocked positions, respectively to expose the film plane to a light image through the lens.

4,319,820

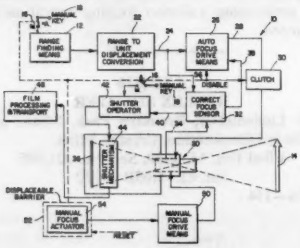
AUTO/MANUAL FOCUS CONTROL INHIBIT/OVERRIDE

John C. Ostrowski, Maynard, and Norman D. Staller, Beverly, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 838,581, Oct. 3, 1977, abandoned. This application Mar. 29, 1979, Ser. No. 25,088

Int. Cl.³ G03B *3/10, 17/04, 17/38*

U.S. Cl. 354—187 **13 Claims**



1. An improved optical system of the type including:

a support housing,

an adjustable focus lens mounted on said housing for focusing an image of a remote object at a focal plane,

energizable first means for deriving a signal representative of the distance between said remote object and said optical system,

energizable second means responsive to said subject distance signal for effecting focusing movement of said lens to a particular focus position, said second means including,

an electrically energizable lens movement generating actuator responsive to said subject distance signal, and

means for coupling said actuator to said adjustable focus lens, said coupling means including a clutch actuatable between a coupled state and an uncoupled state,

wherein the improvement comprises:

said coupling means is positioned on said housing such that at least a portion thereof is accessible for direct manual movement; and

a displacebly mounted cover mounted for displacement between a first position where it precludes direct manual access to said portion of said coupling means and a second position where it does not preclude direct manual access thereto, said clutch being actuatable between its said coupled and uncoupled states by the movement of said displaceably mounted cover between its said first and second positions, said energizable second means being precluded from effecting focusing movement of said lens by said actuator when said cover is displaced to its said second position where it permits direct manual access to and movement of said coupling means.

4,319,821

SHUTTER BLADES FOR CAMERA

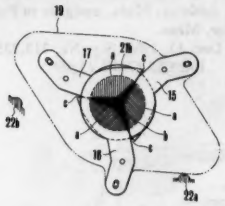
Nobuo Tezuka, Tokyo, and Michio Hirohata, Inagi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1980, Ser. No. 195,659

Claims priority, application Japan, Oct. 13, 1979, 54-141640[U]; Oct. 13, 1979, 54-141642[U]

Int. Cl.³ G03B *9/06, 9/08, 9/02*

U.S. Cl. 354—230 **8 Claims**



2. A shutter for a camera, comprising:

a member defining an opening for passage of light therethrough;

a plurality of shutter blades for opening and closing said opening, said plurality of shutter blades being formed of colored plastic material;

a shutter driving rotor for driving said plurality of shutter blades for opening and closing said opening; and

means for having two or more of said shutter blades overlapped at any part of said opening when said opening is covered with a plurality of shutter blades by said rotor.

4,319,822

ELECTROMAGNETICALLY OPERATED SHUTTER

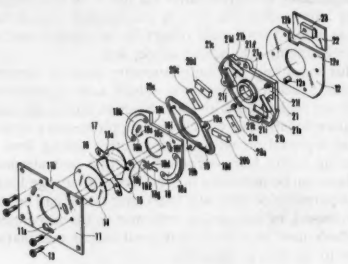
Nobuo Tezuka, Tokyo, and Michio Hirohata, Inagi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1980, Ser. No. 195,852

Claims priority, application Japan, Oct. 13, 1979, 54-141641[U]; Oct. 13, 1979, 54-141643[U]

Int. Cl.³ G03B *9/62, 9/08*

U.S. Cl. 354—234 **5 Claims**



1. An electromagnetically operated shutter for a camera comprising:

a magnetic body having a magnetic circuit formed therein;

a permanent magnet for forming the magnetic circuit in said magnetic body;

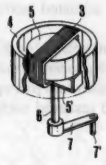
a positioning member of a non-magnetic material and having a fitting part for seating said permanent magnet therein, said positioning member having a frame and a support portion; and

a shutter driving rotor disposed between said magnetic body and said positioning member, said gap being formed by said frame, said rotor being rotatably carried by said support portion of said positioning member.

4,319,823
ELECTROMAGNETIC DRIVING DEVICE

Teiji Hashimoto, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1980, Ser. No. 208,343
Claims priority, application Japan, Nov. 29, 1979, 54-165325[U]
Int. Cl.³ G03B 9/08
U.S. Cl. 354—234 3 Claims



1. An electromagnetic driving device for driving a shutter, comprising:

a stator which is composed of a field coil;

a rotor which is composed of a cylindrical permanent magnet and is arranged to rotate when said field coil is energized;

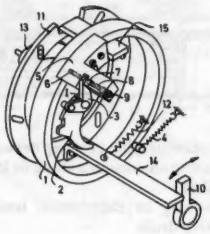
an output shaft in driven engagement with said rotor; and

an intermediate member connecting said rotor to said output shaft, said intermediate member being formed into a U-shape and positioned to extend about one side of said field coil, one side of the intermediate member being secured to said rotor and the other side thereof to said output shaft with said output shaft held in position on a line extending from the center line of the rotor.

4,319,824
REBOUND DAMPING MEANS FOR FAST-CLOSING PHOTOGRAPHIC DIAPHRAGMS

Dieter Rossmann, Aalen, Fed. Rep. of Germany, assignor to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Nov. 12, 1980, Ser. No. 205,918
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1979, 2948066
Int. Cl.³ G03B 9/07
U.S. Cl. 354—272 8 Claims

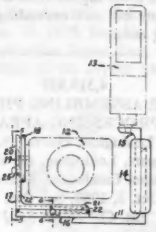


1. Rebound damping means for instant-return diaphragms comprising a slotted ring (11) mounted for rotation to adjust the aperture of the diaphragm, an interception ring (1) mounted for rotation substantially parallel to said slotted ring, a stop (5) on said interception ring for limiting rotary movement of said slotted ring in one direction, a cam for controlling a selected diaphragm aperture, and cooperating parts associated with said cam and said interception ring for limiting the extent to which said interception ring may rotate in said one direction, said cooperating parts including a lever (3) the position of which is varied by said cam and a ball (7) supported from said interception ring and resiliently urged to a position resting eccentrically against said lever.

4,319,825
CAMERA AND FLASH UNIT SUPPORT

Robert B. Newton, 5885 Bartram Cir., N. Jacksonville, Fla. 32207

Filed Mar. 3, 1980, Ser. No. 126,549
Int. Cl.³ G03B 17/00
U.S. Cl. 354—293 28 Claims

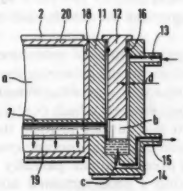


1. A support for a camera comprising a horizontal base plate having opposite end portions, a camera attachment member above and movably connected to said horizontal base plate, elongated link means having spaced end portions, means for pivotally connecting said link means end portions to each of said camera attachment member and said horizontal base adjacent at least one of said base plate end portions, said camera attachment member being rotatable from a position parallel to said base plate to a position substantially vertical thereto, and means to releasably lock said camera attachment member to said base plate in each of said positions.

4,319,826
PROCESS AND APPARATUS FOR DEVELOPING A TWO-COMPONENT DIAZOCOPYING MATERIAL

Götz von dem Bussche, Schwalbach, and Jochen Koblo, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 4, 1980, Ser. No. 137,416
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914774
Int. Cl.³ G03D 7/00
U.S. Cl. 354—299 15 Claims



1. A process for developing a two-component diazocopying material, comprising the steps of:

providing a film of a mixture of ammonia and water flowing uniformly into the interior of an evaporation zone and being uniformly heated at the same time to release a developing gas in the evaporation zone;

providing a liquid developing solution in a sump zone;

evaporating a portion of said developing solution to produce a developing gas in said evaporation zone located above said sump zone;

passing the diazocopying material through a developing zone;

introducing said developing gas from said evaporation zone into said developing zone and contacting said diazocopying material with said developing gas in said developing zone;

maintaining the temperature in said developing zone at a level higher than the temperature at which the developing gas enters from said evaporation zone; and

maintaining the temperature in said sump zone at a constant value without influencing the temperatures in the developing zone and in the evaporation zone; said constant value being at a level higher than the temperature in the evaporation zone but not exceeding the temperature in said developing zone.

4,319,827

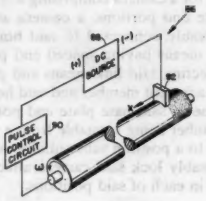
METHOD FOR ASSEMBLING PHOTOGRAPHIC SELF-PROCESSING APPARATUS

Stephen W. Carter, Lexington; Harvey S. Friedman, Sudbury, and Irving S. Lippert, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 3, 1980, Ser. No. 193,617

Int. Cl.³ G03D *5/02*

U.S. Cl. 354—304 **12 Claims**



1. A method for assembling photograhic processing systems from system piecepart lots the individual parts of which vary within prescribed tolerances wherein the processing systems are of the type for advancing integral self-processable film units to the exterior of a camera while simultaneously spreading a fluid processing composition in a uniformly thin layer between selected layers of the film unit and wherein the processing systems include a pair of processing rollers having surfaces which are partially textured by an electric discharge machining process and are resiliently supported in the system by other pieceparts to define a pressure generating gap therebetween through which the film unit is advanced by rotating at least one of the rollers after or just prior to the film unit being brought into engagement therewith, said method comprising the steps of:

partially texturing a number of untextured processing roller blanks of predetermined geometry by transferring to the surface of a roller with a predetermined process a plurality of energy pulses each of which contains sufficient energy to locally melt said surface to form therein a plurality of generally spaced apart microscopic craters to provide said rollers with a predetermined partially textured surface;

randomly selecting a predetermined number of pieceparts from each lot of system pieceparts, except for rollers, and assembling a number of test processing systems therefrom using said rollers having said predetermined partially textured surface;

processing a predetermined number of characteristic film units through each test system and measuring the fluid layer thickness provided by each;

statistically determining the difference between the fluid layer thickness performance of said test systems and a predetermined standard which includes a prescribed tolerance on the allowable variation in fluid layer thickness and deciding if processing systems manufactured with said pieceparts and said rollers having said predetermined partially textured surface will provide acceptable product, and if so, assembling processing systems with said pieceparts and rollers having said predetermined partially textured surface, and, if not;

adjusting said predetermined process conditions used to texture the rollers used in said test systems by a predetermined amount which is sufficient to alter roller surface texturing enough to effect a minor change in the fluid thickness that can result in an acceptable product when rollers having said adjusted texture are used with said piecepart lots; and

texturing a number of rollers with said adjusted process having said adjusted process conditions and assemblying processing systems with said piecepart lots and said rollers having said adjusted textured surfaces.

4,319,828

COPYING APPARATUS WITH A HEATED PHOTOSENSITIVE DRUM

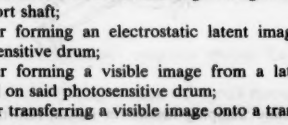
Shigehiro Komori; Hisashi Sakamaki, both of Yokohama; Hiroyuki Hattori, Mitaka; Toshihide Iida; Koichi Miyamoto, both of Tokyo, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 676,615, Apr. 13, 1976, abandoned, which is a division of Ser. No. 583,247, Jun. 3, 1975, Pat. No. 4,009,955, which is a continuation of Ser. No. 461,104, Apr. 15, 1974, abandoned, which is a continuation of Ser. No. 258,820, Jun. 1, 1972, Pat. No. 3,804,512. This application Jun. 21, 1979, Ser. No. 50,648

Claims priority, application Japan, Jun. 3, 1971, 46-38917; Jun. 3, 1971, 46-38918; Jun. 9, 1971, 46-48632; Jun. 10, 1971, 46-41195; Jun. 10, 1971, 46-41996; Jun. 10, 1971, 46-41197; Jun. 21, 1971, 46-44611; Aug. 30, 1971, 46-66740

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **9 Claims**



1. An electrophotographic copying device comprising:

a photosensitive drum mounted along its longitudinal axis on a support shaft;

means for forming an electrostatic latent image on said photosensitive drum;

means for forming a visible image from a latent image formed on said photosensitive drum;

means for transferring a visible image onto a transfer material;

means for fixing a transferred image onto the associated transfer material;

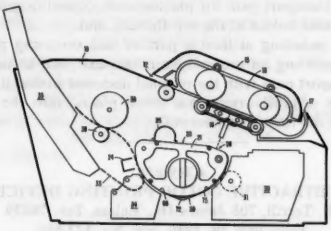
means including an elongated heater extending along and within said support shaft and inside said mounted drum for substantially uniformly heating said photosensitive drum to remove moisture therefrom; and

means for applying heated air to said photosensitive drum, wherein said air is heated by said fixing means before it is applied to said photosensitive drum.

4,319,829
NONCIRCULAR PHOTOCONDUCTOR BELT MOUNTING APPARATUS AND METHOD

Donald L. Janeway, III, Broomfield, and Peter A. Stevenson, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 30, 1980, Ser. No. 173,590
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 BE **9 Claims**



1. In a machine having a housing in which is to be mounted a flexible, closed loop belt including a photoconductor for use in conjunction with a xerographic process or the like and wherein the machine includes at least one element configured with an interface for operatively cooperating with a photoconductively surfaced drum having a radius R and a circumference of a length adequate to receive the image of an original document or the like, apparatus for noncylindrically mounting the belt comprising:

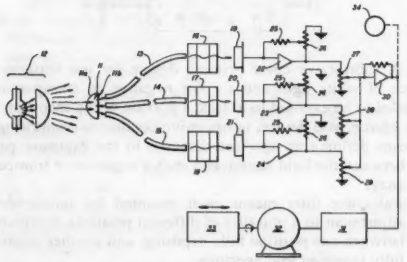
guide means having a plurality of outwardly facing surfaces forming a series of interconnected courses for supportingly engaging the interior surface of the belt in a closed loop path, at least one of said surfaces being configured for defining a said course in the form of a segment of the periphery of a cylinder of said radius R with the adjacent said courses being configured with other than said radius R, and

means attaching said guide means relative to the machine housing for locating said cylinder segment surface in facing relation to the machine element interface.

4,319,830
MULTISPECTRAL LIGHT DETECTION SYSTEM

Terence Roach, 838 Bennett St., Fairfield, Conn. 06432

Filed Aug. 6, 1979, Ser. No. 64,340
Int. Cl.³ G03B *27/72*
U.S. Cl. 355—1 **16 Claims**



1. A system for monitoring light from a light source comprising in combination,

a plurality of light selector means,

filter means associated with each of said light selector means for transmitting light of a preselected bandwidth from each of said selector means,

detector means associated with each of said filter means for converting each of said preselected bandwidths of light to an electrical signal,

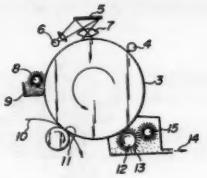
summing means connected to said detector means providing an output signal which is a composite of each of said electrical signals from each detector means,

a motor connected to the output of said summing means providing a mechanical output having a speed proportional to said composite signal.

4,319,831
CLEANING DEVICE IN A COPYING MACHINE

Masao Matsui, Takatsuki, and Hiroshi Naito, Osaka, both of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Dec. 12, 1979, Ser. No. 102,594
Claims priority, application Japan, Dec. 19, 1978, 53/157879
Int. Cl.³ G03G *15/06, 21/00*; A46B *15/00*
U.S. Cl. 355—15 **15 Claims**



1. In an electrostatic copying machine comprising a member adapted to receive an electrostatic latent image on its surface, a developer system adapted to apply toner to the surface of said member to develop the electrostatic latent image to form a developed image on said member, a transfer system adapted to transfer the developed image from the surface of said member to another substrate and a cleaning device for removing residual toner that adheres to the surface to said member after the developed image has been transferred, the improvement wherein the contacting portion of said cleaning device that contacts the surface of said member for removing the residual toner comprises electrically conductive, synthetic resin, composite fibers, said composite fibers consisting of at least one electrically conductive layer containing electrically conductive fine particles and at least one electrically non-conductive layer.

4,319,832
TONER SEPARATION AND RECOVERY APPARATUS

Koji Sakamoto; Masayuki Hayashi; Yutaka Koizumi, and Misao Tanzawa, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 108,979
Claims priority, application Japan, Jan. 29, 1979, 54-10430[U]
Int. Cl.³ G03G *21/00*
U.S. Cl. 355—15 **14 Claims**

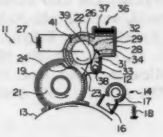
14. A toner separation and recovery apparatus including removal means for removing usable toner and foreign matter from a dielectric member after transfer of a toner image from

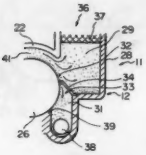
the dielectric member to another member, characterized by comprising:

a passageway means, a toner recovery chamber and a foreign matter chamber;

blower means for causing air flow through the passageway means from the removal means to the toner recovery chamber and the foreign matter chamber, the toner recovery chamber being disposed downstream of the foreign matter chamber;

electrode means having a surface defining a wall of the





passageway means, toner recovery chamber and foreign matter chamber and moving in a direction of the air flow;

power source means for applying an electric potential to the electrode means having a polarity opposite to an electrostatic charge on the usable toner; and

separator means for separating the toner recovery chamber from the foreign matter chamber and extending closely adjacent to said surface of the electrode means;

the foreign matter chamber being formed with an outlet, the apparatus further comprising a filter mounted at the outlet.

4,319,833

ORIGINAL FEED SYSTEM FOR COPYING MACHINE

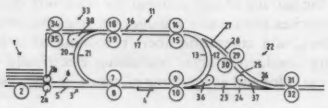
Gerhard Hidding, Venlo, Netherlands, assignor to Océ-Nederland B.V., Venlo, Netherlands

Filed Jun. 5, 1980, Ser. No. 156,689

Claims priority, application Netherlands, Jun. 27, 1979, 7904987

Int. Cl.³ G03B *27/32*; B65H *5/00*

U.S. Cl. 355—23 **12 Claims**



1. Apparatus for feeding sheetlike originals for copying in a copying machine having an illumination station for exposing one side of one original at a time, said station having inlet and exit sides, comprising:

a holder for a stack of the originals,

means including a first transport path extending from the bottom of said holder to and through the illumination station for removing the lowermost original from the holder and conveying it to said station in position for copying its side that faced downward in the holder,

a return path section having an outlet merging into said first transport path and directed toward the inlet side of said station at a location between said holder and said inlet side,

reversing means including a reversing path for receiving an original fed from the exit side of said station and delivering the original in inverted position, and including a connecting path section spaced away from said first transport path for guiding an original delivered from said reversing path to the entrance of said return path section for return of the original to said station via said inlet side in position for copying the other side of the original,

a final transport path for placing each copied original back into said holder at the top thereof, and

means including at least a part of said reversing path for transporting an original from said exit side to said final transport path with the original disposed so that it will be in its original orientation when placed into the holder from the final transport path.

4,319,834

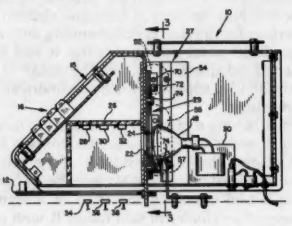
SUBTRACTIVE COLOR PRINTING DEVICE

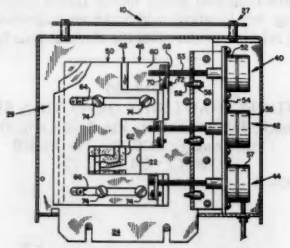
Kenneth P. Terrill, 705 John's Dr., Euless, Tex. 76039

Filed Feb. 19, 1980, Ser. No. 122,606

Int. Cl.³ G03B *27/72*

U.S. Cl. 355—35 **6 Claims**





1. A subtractive color printing device for use between a source of white light and a color negative or transparency intended to be exposed to at least a portion of the spectrum of such source, said device, in operative condition, comprising,

means defining an aperture disposed in the exposure path between the light source and such a negative or transparency,

plural color filter means each mounted for independent adjustment to a plurality of different positions distributed between one position fully exposing, and another position fully spanning said aperture,

stepper motor means operatively connected to said filter means for adjusting the same to such different positions in one or more uniform discrete steps,

computer means operatively connected to said motor means, said computer means being operable to apply digital voltage pulses to said motor means, each such pulse producing a step in said motor means,

memory means operatively connected to said computer

means, said memory means havng stored therein density point values for each filter and having a calibration-determined filter position value associated with each such density point value, and

input means operatively connected to said computer means for instructing the same, said input means including a key pad for selecting density point values for each filter.

4,319,835

COPYING MACHINE WITH ORIGINAL CARRIAGE MOVING DEVICE

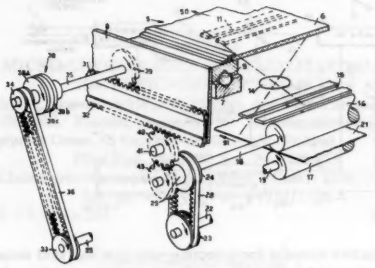
Lorenzo Navone, Turin, Italy, assignor to Ing. C. Olivetti & C., S.p.A, Ivrea, Italy

Filed Mar. 10, 1980, Ser. No. 128,819

Claims priority, application Italy, Mar. 14, 1979, 67533 A/79

Int. Cl.³ G03B *27/48, 27/50*

U.S. Cl. 355—50 **5 Claims**



1. A copying machine comprising a drive element for advancing a photo sensitive-element at a first constant velocity in an exposure region, a carriage for transporting the original at a second constant velocity along a scanning path, whereby the image of the original is transferred onto the photo sensitive element, carriage drive means capable of transmitting a force to said carriage sufficient to drive said carriage at a velocity exceeding said second velocity, coupling means arranged between said carriage and said drive element for limiting the velocity of said carriage to said second velocity, and friction means for allowing slip in the carriage drive means.

4,319,836

OPTICAL DEVICE OF A COPYING APPARATUS

Shinji Murata, Tokyo; Akiyoshi Torigai, Machida; Teruo Morikawa, Sagamihara; Masaki Nakaoka, and Yoshiaki Sone, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1979, Ser. No. 102,276

Claims priority, application Japan, Dec. 19, 1978, 53/174530[U]; Dec. 19, 1978, 53/174531[U]; Dec. 19, 1978, 53/174532[U]

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—55 **14 Claims**

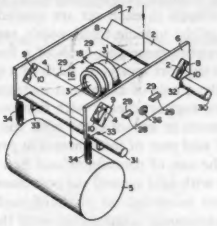
13. An optical device for projecting an image of an original to be copied onto a photosensitive member of a copying machine, comprising:

means for reflecting light from the original;

an imaging lens for receiving the light from said reflecting means and projecting the light on the photosensitive member;

a lens barrel having therein said imaging lens; and

supporting means for supporting said lens barrel on the copying machine, said supporting means including a plate member provided with a punched opening having two linearly opposed edges which are spaced apart a distance which is less than a diameter of said lens barrel, and wherein said supporting means includes a fixing member



for fixing the lens barrel in the opening so that the optical axis of the lens is in parallel with the plate member.

4,319,837

DEVICE FOR CONTROLLING THE CORRECT POSITIONING OF A FILM CASSETTE IN A CASSETTE HOLDER

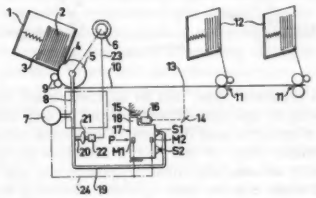
Bengt Akerström, Lidingö, and Per Molinder, Rönninge, both of Sweden, assignors to Hugin Kassaregister AB, Stockholm, Sweden

Filed Mar. 12, 1979, Ser. No. 19,337

Claims priority, application Sweden, Mar. 15, 1978, 7802988

Int. Cl.³ G03B *27/60*

U.S. Cl. 355—73 **7 Claims**



1. A device for assuring the correct positioning of a film cassette in a cassette holder provided with cassette guide means for photographing a series of documents withdrawn from a storage box by means of a withdrawal mechanism including a drive source and to be transported to processing and storage places, comprising: at least one suction cup attached on a part of the holder with an opening in a plane corresponding to the correct position of a predetermined surface of the cassette in the holder; a vacuum source; conduit means connecting said suction cup opening to said vacuum source; means for controlling the operation of said withdrawal mechanism; pressure-sensitive means connected to said conduit means and responsive to the vacuum system produced by sealing contact between the suction cup and said predetermined surface of the cassette when the cassette is in the correct position in the holder for said vacuum source to deliver sufficient vacuum for causing the pressure-sensitive means to actuate said control means for operating the document withdrawal mechanism or the drive source thereof.

4,319,838

VEHICLE WHEEL ALIGNMENT APPARATUS

James M. Grossman, Chesterfield, and Daniel B. January, Bel-Ridge, both of Mo., assignors to Hunter Engineering Company, Bridgeton, Mo.

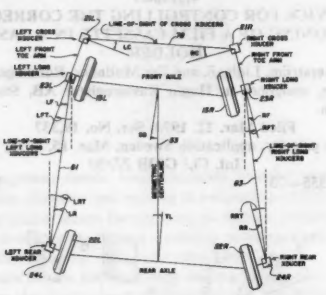
Filed Oct. 1, 1979, Ser. No. 80,274

Int. Cl.³ G01B *11/26, 5/24*

U.S. Cl. 356—152 **3 Claims**

1. Apparatus for measuring the alignment of steerable and

non-steerable vehicle wheels in relation to a vehicle reference axis and the thrust line of the non-steerable wheels to that reference axis and in which the wheels are arranged in sets spaced apart a distance representative of the vehicle wheel base, and the wheels in each set are spaced apart a distance representative of the vehicle tread width, said apparatus comprising: first support means on each of a first set of steerable wheels; second support means on each of a second set of non-steerable wheels; a pair of alignment instruments mounted on each of said first support means with first ones of each of said pair of instruments in line-of-sight with each other and with second ones of said pair of instruments in predetermined relationship with the axis of rotation of said first set of wheels and in line-of-sight with said second support means; a single alignment instrument mounted on each of said second support means in predetermined relationship with the axis of rotation of said second set of wheels and in line-of-sight with said second ones of said pair of instruments; all of said instruments having active components which include a non-directional radiant energy beam emitter, a pair of spaced apart detectors



lying in a common plane, and an adjacent beam control flat mask having an aperture aligned in front of and spaced from said pair of detectors and the plane of said mask being parallel to the common plane of said pair of detectors and positioned for normally substantially equally exposing said pair of detectors; said beam control mask aperture admitting the radiant energy beam along a path from a line-of-sight instrument to said adjacent pair of detectors, whereby said pair of detectors are actively responsive in proportion to the radiant energy received thereby and generate signals proportional to the angle of the radiant energy beam in relation to the plane of said mask which represents the alignment position of the vehicle wheel upon which it is mounted, each said pair of detectors and the associated beam mask being movable with its support means so as to assume wheel alignment positions independent of the path of the radiant energy beam from the line-of-sight instrument for generating alignment information; and means connected to all of said pairs of detectors for processing the signals in terms of the alignment of the steerable wheels to the vehicle reference axis and the effect of the thrust line of the non-steerable wheels.

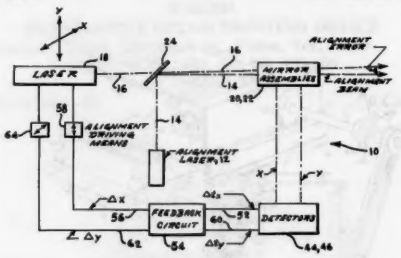
4,319,839

BEAM ALIGNMENT SYSTEM

Donald A. Durran, Manhattan Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 27, 1980, Ser. No. 134,597
Int. Cl.³ G01B 11/27
U.S. Cl. 356—153 **6 Claims**

1. A beam alignment system comprising a first reflective element, means for rotating said first reflective element about a first axis, a second reflective element, means for rotating said second reflective element about a second axis, said first axis and said second axis being positioned at right angles to each other, said first reflective element being rotatable through a first preselected position at a first preselected time so as to intercept the optical path of a first beam of electromagnetic radiation and a second beam of electromagnetic radiation to be aligned with said first beam, said first reflective element reflecting said first and second beams therefrom, said second reflective element being rotatable through a second preselected position at a second preselected time so as to intercept the optical path of said first beam and said second beam, said second reflective element reflecting said first and said second beams therefrom, said first and said second reflecting means being so positioned with respect to each other so as to intersect said optical path of said first and said second beams at different times and wherein said optical path of said first and second beams is generally unoccluded as said beams pass through said system except during said first preselected time and said second preselected time, first means optically aligned with said



first reflective element for detecting said first and said second beams reflected from said first reflective element and producing a first signal in response thereto, said first signal being indicative of a time interval between the reception by said first detecting means of said first reflected beam and said second reflected beam, whereby said first signal is representative of any misalignment between said first beam and said second beam in a first plane, second means optically aligned with said second reflective element for detecting said first and said second beams reflected from said second reflective element and producing a second signal in response thereto, said second signal being indicative of a time interval between the reception by said second detecting means of said first reflected beam and said second reflected beam, whereby said second signal is representative of any misalignment between said first beam and said second beam in a second plane.

4,319,840

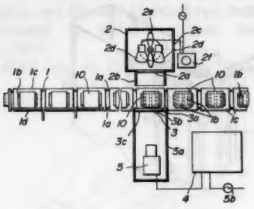
METHOD AND A DEVICE FOR INSPECTING BODIES HAVING A MULTIPLICITY OF PARALLEL CHANNELS EXTENDING THERETHROUGH

Suzuhiko Kondo, Iwakura, and Kei Yamada, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Apr. 11, 1979, Ser. No. 29,003
Claims priority, application Japan, Apr. 21, 1978, 53/48277
Int. Cl.³ G01N 21/16
U.S. Cl. 356—241 **2 Claims**

1. A method of inspecting ceramic honeycomb structural bodies, each said body having a multiplicity of parallel longitudinal channels extending therethrough which channels are separated by thin partition walls, comprising the steps of irradiating substantially uniform and parallel light beams onto one end face of a said body in an axial direction of said channels to project a lattice image substantially the same as the one end face configuration of said body on a projection screen arranged opposite the other end face of said body, and finding invisible

cracks in said body which exist at locations along the channel walls by detecting bright portions in the image projected on



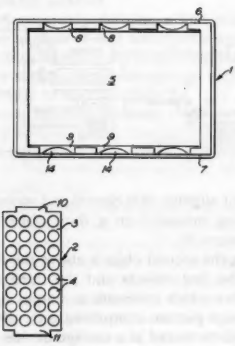
said screen, said bright portions being created by light beams passing through the cracks of the partition walls.

4,319,841

MICRO-CUVETTE UNIT FOR FACILITATING THE IDENTIFICATION OF SAMPLES

Osmo A. Suovaniemi; Pertti Ekholm, and Paul Partanen, all of Helsinki, Finland, assignors to Kommandiittiyhtio Finnpipette Osmo A. Suovaniemi, Helsinki, Finland

Filed Feb. 28, 1980, Ser. No. 125,475
Claims priority, application Finland, Mar. 1, 1979, 790692
Int. Cl.³ G01N *21/03;* C12M *1/20*
U.S. Cl. 356—244 **3 Claims**



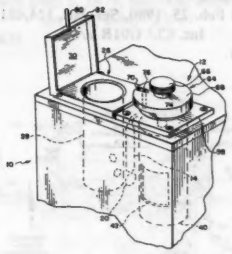
1. A micro-cuvette unit comprising a plurality of cuvettes in the form of a matrix arranged so that said cuvettes may be handled as one unit wherein the structural body of the micro-cuvette unit comprises a rectangular frame part which is designed so that a plurality of cuvette components may be fitted to said frame one after the other, each cuvette component comprising a plurality of cuvettes arranged in the form of a line or matrix and connected to each other directly or by means of sufficient discs whereby said frame part is open in the middle at least within the area covered by said cuvettes in said cuvette components and wherein said frame part contains two opposite sides which are provided with connecting means for joining said cuvette components to said frame part wherein said connecting means between said frame part and said cuvette components are different on different sides of said frame part and on different sides of said cuvette components respectively so as to determine the positions of said cuvette components in relation to each other and to facilitate the identification of samples placed within said cuvettes and preventing said samples from becoming intermixed with one another.

4,319,842

PHOTOMULTIPLIER PROTECTOR FOR A FLUOROMETER

Paolo Priarone, Hyattsville, and Peter A. St. John, Adelphi, both of Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jul. 17, 1980, Ser. No. 169,607
Int. Cl.³ G01N *21/64*
U.S. Cl. 356—317 **3 Claims**



1. In a photometer which is particularly adapted for sensing radiation emitted by a chemical sample held in a cuvette in a first compartment and which includes a highly sensitive photomultiplier in a second compartment adjacent the first compartment for detecting fluorescent radiation emitted by the chemical sample and passing through an opening between the compartments, the improvement comprising: means for protecting the photomultiplier from ambient light, said protecting means including a movable cylindrical light shield movable between a first position blocking the opening and a second position not blocking the opening and means for moving said light shield to said first position to protect said photomultiplier from light entering from the first compartment when the first compartment is opened for insertion or removal of a cuvette, and for moving said light shield to said second position not blocking the opening to permit radiation emitted by said chemical sample to impinge upon the photomultiplier in the second compartment, said light shield being made of opaque material and having a single opening therein which is in registry with the opening between said compartments when said light shield is in said second position so that radiation may pass from the chemical sample to the photomultiplier, said moving means including a shaft fixed at one end to the top of said cylindrical shield and coaxial therewith, an upper end of said shaft extending through the top of the second compartment, a knob fixed to the upper end of said shaft, a larger diameter apron beneath and integral with said knob, said apron being constructed with an undercut section opening onto the bottom of said apron and onto the side periphery of said apron through a predetermined arcuate angle so that said undercut section also is defined between a first end wall and a second end wall arcuately spaced from said first end wall in said apron, said apron further having a radial slot therethrough opening onto a top surface of said apron and into said undercut section adjacent said first end wall, a spring biased pin extending from the top of the second compartment, said slot in said apron being aligned with, and receiving therein, said pin when said shield is in said first position, the engagement of said pin in said slot locking said shield in said first position, and the top of the first compartment having a pivoted cover with an elongate tongue extending laterally from a side edge thereof and being received in said slot when the cover is moved from a cover raised position to a cover lowered position, said tongue then depressing said pin below said apron until said tongue is beneath said undercut section, and means for rotationally biasing said apron in one arcuate direction so that when said tongue is beneath said undercut section, said biasing means can move said apron to move said second wall against said tongue where said shield is locked in

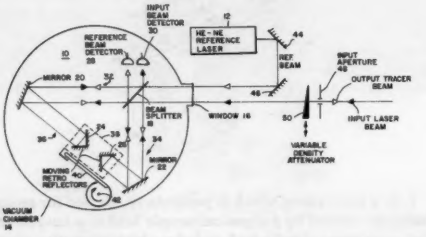
said second position and the cover is locked in the lowered position, and opening of said cover being enabled by rotating said knob in the opposite arcuate direction against said biasing means until said tongue is received in said slot.

4,319,843

INTERFEROMETER APPARATUS FOR THE DIRECT MEASUREMENT OF WAVELENGTH AND FREQUENCY

William S. Gornall, Fairport, N.Y., assignor to Burleigh Instruments, Inc., Fishers, N.Y.

Filed Feb. 25, 1980, Ser. No. 124,481
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—346 **8 Claims**



1. Apparatus for making interferometic measurements of an input laser beam through the use of a reference laser beam which comprises a dual beam moving mirror interferometer having an entrance, a beamsplitter, a reference beam detector, an input beam detector, a pair of conjointly reciprocally movable folded mirrors and a pair of stationary mirrors which define first and second parallel paths through said beamsplitter along which said reference beam passes in opposite directions through said entrance to provide a tracer beam for alignment of said input beam to pass through said entrance into said interferometer along said second path in the opposite direction to said reference beam, said beamsplitter and said movable folded mirrors also defining third and fourth paths of varying lengths along which said reference beam passes to said reference beam detector and along which said input beam passes to said input beam detector respectively, means connected to said reference beam detector and to said input beam detector for respectively providing first and second trains of pulses when interference fringes are produced at said detectors while said folded mirrors reciprocate, and means for translating the numbers of pulses in said first and second trains into an output directly representing the wavelength or frequency of said input beam.

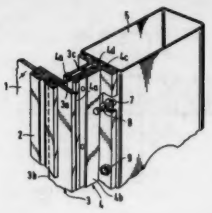
4,319,844

METHOD OF ADJUSTING A SWIVELING SOLAR REFLECTOR WITH MULTIPLE REFLECTING ELEMENTS SUPPORTED BY PREFABRICATED CAMBERED MEMBERS

Robert H. Auger, Le Vesinet, France, assignor to Saint Gobain Industries, Neuilly-sur-Seine, France

Division of Ser. No. 27,476, Apr. 5, 1979, Pat. No. 4,226,506. This application Mar. 3, 1980, Ser. No. 126,425
Claims priority, application France, Apr. 10, 1978, 78 10508; Nov. 10, 1978, 78 31808
Int. Cl.³ G02B *11/24*
U.S. Cl. 356—399 **1 Claim**

1. A method of adjusting the position of a solar reflector having a plurality of rectangular reflector panels with respect to a rigid supporting base which includes girders and where the panels are held by means of a support framework comprising a plurality of joists formed by parallel beams having cambered members supporting the panels and joined to the beams where the beams are connected to the girders by adjustable means, comprising the step of utilizing a laser and a revolving prism to establish a reference plane and the step of adjusting a joist with respect to the rigid supporting base by bringing



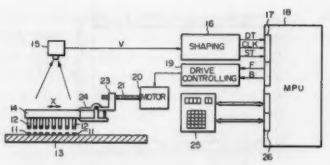
electronic sights fixed to a cambered member into said reference plane by moving an adjusting means to move a beam with respect to a girder.

4,319,845

METHOD FOR ACHIEVING ALIGNMENT BETWEEN OBJECTS

Takeshita Shuji, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 10, 1979, Ser. No. 101,691
Claims priority, application Japan, Dec. 27, 1978, 53/159981
Int. Cl.³ G01B *11/00*
U.S. Cl. 356—400 **13 Claims**



1. A method for aligning first objects and second objects, the first objects being mounted on a third object, the method comprising the steps of:

(a) positioning the second objects above the first objects;

(b) imaging the first objects and the third object with a sensor camera which generates an output signal to obtain a master image pattern comprising n-bit data, where n is an integer, to be stored in a storage device;

(c) imaging the whole of the first and second objects and the third object with the sensor camera by locating the second objects directly above the first objects in order to obtain a scanned whole image pattern comprising n-bit data;

(d) moving the first and second objects relative to each other within the field of view of the sensor camera;

(e) constructing a relationship curve with respect to variations of a first variable indicating the displacement of the second objects from the first objects and a second variable indicating the variation of the output signal from the sensor camera, the second variable representing the variation of the total length of the second objects which are located only above the the portions of the third object on which the first objects are not mounted;

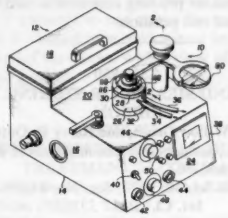
(f) stopping the movement of the second objects when the value of the second variable defining the relationship curve becomes equal to a predetermined desired value which is expressed by the minimum total length of the images corresponding to the second objects which are located only above the portions of the third object on which the first objects are not mounted.

4,319,846

METHOD AND APPARATUS FOR ALIGNING AN OPHTHALMIC LENS DURING A BLOCKING OPERATION

David W. Henry, and Herbert H. Mathews, both of Muskogee, Okla., assignors to Coburn Optical Industries, Inc., Muskogee, Okla.

Filed Dec. 26, 1979, Ser. No. 106,830
Int. Cl.[3] B01B *11/26*
U.S. Cl. 356—401 1 Claim



1. An alignment apparatus operable for use in aligning ophthalmic lens to be blocked comprising:

a support stanchion operable to be mounted upon a lens blocking apparatus;

first arm means connected to said support stanchion and radially extending outwardly therefrom;

lens alignment means carried by a radially outward end of said first arm means, said lens alignment means including,

a transparent member having upper and lower mutually parallel planar surfaces,

a first indicia operably defining a line extending across said upper surface of said transparent member,

a second indicia operably defining a line extending across said upper surface of said transparent member and lying perpendicular to said first indicia,

a third indicia operably defining a line extending across said lower surface of said transparent member and lying in a plane perpendicular to said upper and lower planar surfaces of said transparent member and intersecting said first indicia, and

a fourth indicia operably defining a line extending across said lower surface of said transparent member and lying in a plane perpendicular to said upper and lower planar surfaces of said transparent member and intersecting said second indicia, wherein an opthalmic lens having horizontal and vertical indicia imprinted thereon may be optically aligned beneath said alignment means with a minimum of parallax error by vertically aligning said first and third indicia with one of the horizontal and vertical lens indicia and vertically aligning said second and fourth indicia with the other of the horizontal and vertical lens indicia;

second arm means connected to said support stanchion and radially extending outwardly therefrom;

lens retaining means carried by a radially outward end of said second arm means for operably retaining a lens to be blocked by the lens blocking apparatus;

spring means operably connected to said second arm means for biasing said lens retaining means in securing contact with the lens to be blocked by the lens blocking apparatus;

pivotal mounted means interconnecting said first arm means, said second arm means and said stanchion for selectively pivoting one of said lens alignment means and said lens retaining means in a first position in operative alignment with a lens to be blocked and for selectively pivoting the other of said lens alignment means and said lens retaining means in a second position in operative alignment with the lens to be blocked; and

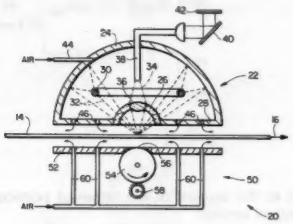
means for selectively securing said pivotal mounted means in said first and second operative position with respect to the lens to be blocked.

4,319,847

APPARATUS TO MEASURE SELECT PROPERTIES OF A MOVING SHEET WITH IMPROVED STANDARDIZATION MEANS

John J. Howarth, Monte Sereno, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Dec. 5, 1979, Ser. No. 100,417
Int. Cl.[3] G01N *21/47*
U.S. Cl. 356—431 10 Claims



1. An apparatus to measure select properties of a moving sheet, said apparatus, insensitive to the flutter of said sheet, comprising:

a source to one side of said sheet capable of emitting a beam of electromagnetic radiation;

said beam aligned to impinge said sheet;

said radiation selected such that said beam is capable of being absorbed and being reflected by the sheet;

a collector to one side of said sheet capable of receiving a portion of said beam reflected from said sheet;

a detector capable of measuring said select properties of said sheet based upon said radiation received by said collector;

first means for holding said source and said collector at a constant distance from said sheet;

a rotating standardization member with cleaning means in continuous contact with said member to the other side of said sheet; and

second means for spacing said rotating member a constant distance from said sheet to permit free movement of said sheet and to prevent any contact between said rotating member and said sheet.

4,319,848

APPARATUS FOR THE PRODUCTION OF ADDITIVE CONTAINING SYNTHETIC LINEAR POLYMERS

Giorgio Lambertini, Barlassina, and Gianfranco Sala, Milan, both of Italy, assignors to SNIA VISCOSA Societa Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Division of Ser. No. 946,531, Sep. 27, 1978, Pat. No. 4,221,682.
This application Mar. 21, 1980, Ser. No. 132,544
Claims priority, application Italy, Sep. 30, 1977, 28138 A/77
Int. Cl.[3] B01F *15/02, 15/04*
U.S. Cl. 366—136 3 Claims

1. An apparatus for the production of an additive-containing synthetic linear polymer, which comprises

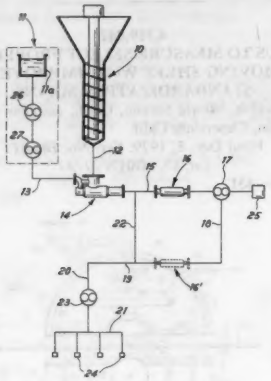
means for adding a fluid stream of the additive to a fluid stream of the polymer to produce a fluid additive-polymer stream,

means for homogenizing the additive-polymer stream,

means for recycling a portion of the homogenized stream to a zone of said apparatus upstream of said homogenizing means,

means for removing the remainder of the homogenized stream from said apparatus, and

variable delivery pump means for varying the ratio of the amount of the recycled portion of the homogenized



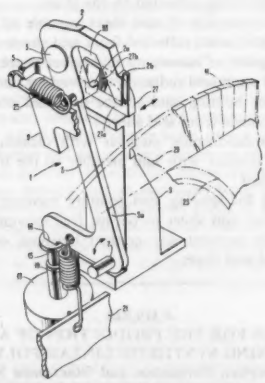
stream to the amount of the removed portion of the homogenized stream.

4,319,849

PRINT HAMMER FOR HIGH SPEED IMPACT PRINTER

William L. Dollenmayer, Versailles, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,613
Int. Cl.[3] B41J *1/24*
U.S. Cl. 400—144.2 9 Claims



1. In an impact printer wherein a character print cycle involves moving a print hammer from a rest position to an impact position in which a selected character printing element borne by a movable type-face-carrier having plural character printing elements is struck by the print hammer onto a recording medium held by a platen and then subsequently moving said print hammer back to said rest position while the non-selected character printing elements of said type-face-carrier are moved through a scanning path for positioning the next selected character printing element, said print hammer comprising:

a frame;

a power arm mounted on said frame and movable toward and from the surface of the platen;

a heammer head;

pivot means connecting said hammer head to said power arm;

driver means for reciprocatably moving said power arm and for moving said hammer head to enter through said scanning path to engage said selected character printing element as said hammer head travels toward said platen; and,

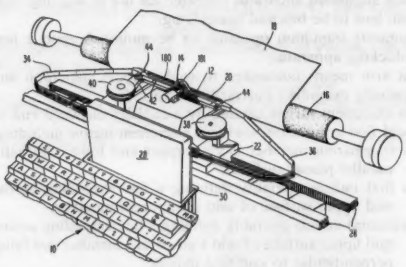
a cam means attached to said frame for causing said hammer head to pivot about said pivot means relative to said power arm for inhibiting the hammer head from re-entering the scanning path of the non-selected character printing elements while said print hammer is traveling back from said impact position to said rest position whereby said hammer head does not contact the moving non-selected character printing elements as said print hammer returns to said rest position.

4,319,850

METHOD AND MEANS FOR STORING TYPING RIBBON

Michael J. Rello, Willow Grove, and Barry R. Detwiler, Royersford, both of Pa., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 30, 1979, Ser. No. 61,875
Int. Cl.[3] B41J *35/00*
U.S. Cl. 400—247 13 Claims



1. In printing apparatus of the type wherein ribbon is passed along a path from a first spool, traversed past a print location where it is impacted for printing on a print medium and then spooled upon a second spool prior to disposal, the tape being of the type which is stretched beyond its elastic limit by being impacted for printing, the improvement which comprises:

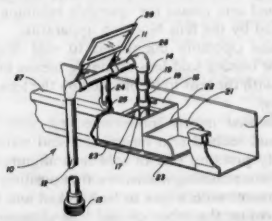
providing means located between said print location and said second spool for preferentially stretching a part of said ribbon to a degree such that its elastic limit is exceeded, whereby material takes on a permanent crown providing ease of spooling.

4,319,851

DEVICE FOR CLEANING RAIN GUTTERS

Frederick M. Arthur, 6300 Wyoming, St. Louis, Mo. 63139

Filed May 27, 1980, Ser. No. 153,185
Int. Cl.[3] B08B *9/00*; A47L *25/00*
U.S. Cl. 401—137 5 Claims



1. A cleaning device for roof gutters which comprises an

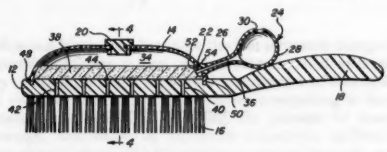
inverted U-shaped tube with arms of unequal length, the longer arm being of sufficient length to extend beyond the height of the gutter and being adapted at its open end for connection to a source of water, and the shorter arm projecting downwardly into a scoop which fits inside the gutter and is positioned longitudinally with respect to said gutter and which is attached to the shorter arm, said shorter arm being provided at its lower end with a plurality of openings for the release of the water longitudinally of the gutter, which openings face toward the front of the scoop, said device further including a mirror which is attached to and above the horizontal segment of the inverted U-shaped tube, said mirror being positioned to provide the user of the device with a view of the inside of the gutter from the ground.

4,319,852

BRUSH WITH PNEUMATICALLY DISCHARGED TREATMENT MATERIAL

James L. Bell, and Dorothy L. Bell, both of 1301 Dogwood Dr., Memphis, Tenn. 38111

Filed Jun. 16, 1980, Ser. No. 160,012
Int. Cl.³ B43M *11/06*
U.S. Cl. 401—185 **3 Claims**



1. A material dispensing brush including a handle and a bristle-retaining plate associated therewith, said bristle-retaining plate having a plurality of bristles fixedly positioned thereon, said dispensing brush further including:

a rigid shell having its edges fixedly attached to the bristle-retaining plate and having an interior defining a material holding chamber means for holding treatment material to be dispensed;

a deformable hollow resilient member separately communicating with the holding chamber means through an elongated tube means connecting to a wall of the rigid shell and to a wall of the holding chamber means, the deformable resilient member having a pressure relief hole in a surface of the deformable resilient member and defining therewith a pressure relief means and being positioned substantially adjacent the handle whereby placing one's thumb over the pressure relief hole closes the hole and whereby applying continuing pressure by the thumb onto the handle and compressing the resilient member directs air from the deformable resilient member through the tube means into the holding chamber means to effect an increase in air pressure in the holding chamber means;

a plurality of orifices constructed in the bristle-retaining plate and having their longitudinal axes lying substantially in the same plane to provide a controlled dispensing of the treatment material with little or no wastage and providing the advantage of being able to carefully direct the flow of treatment material to a desired location, the orifices releasing the increase in air pressure in the holding chamber means and serving to direct a flow of material from said holding chamber means onto a work surface engaged by bristles of the bristle-retaining plate, the orifices including a narrow, longitudinal cylindrically-shaped bore section adjacent the work surface thereof and further including a concentrically aligned truncated bore section communicating therewith and with the holding chamber means, a first end of the truncated bore section being of substantially the same diameter as the cylindrically-shaped bore section and a second end of the truncated bore section being of a greater diameter than said cylindrically-shaped bore section; and

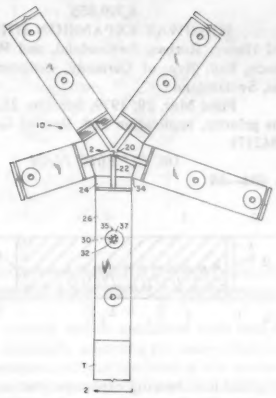
a removable filler plug inserted in an opening in an uppermost portion of the holding chamber means and being removable to permit the filling of the holding chamber means with the treatment material.

4,319,853

GEODESIC DOME STRUCTURE TIE-BEAM CONNECTOR

Martha E. Phillips, 3906 Ridgecroft Rd., Baltimore, Md. 21206

Filed Feb. 20, 1980, Ser. No. 122,988
Int. Cl.³ F16B *7/00*
U.S. Cl. 403—172 **4 Claims**



1. In a connector for geodesic domes, of the type having a plurality of rectangular-section ribs radiating, in equal circumferential spacing, from juncture of the same along an axis, with each rib oriented so that the height of each rib is in a plane parallel to said axis, and with each rib inclined equally from the perpendicular to the axis for holding tenon-ends of tie-beams in generally circumferential alignment relative to a geodesic dome, the improvement comprising: means for clamping tie-beam tenon ends rigidly in direction radial to a said geodesic dome while providing limited flexure and adjustment in direction circumferential of a said geodesic dome, including a respective transverse plate affixed squarely and symmetrically across the outer end of each rib, a pair of flexible vice-jaws extending from each transverse plate in an outward direction generally aligned with the direction of radiation of a respective rib and spaced apart along said axis, each pair of flexible vice jaws having first and second aligned sets of holes for receiving bolts therethrough and through a tenon end of a tie-beam for drawing together said vise-jaws and clamping the tie-beam.

4,319,854

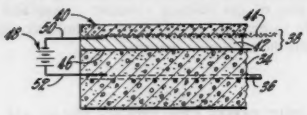
MOISTURE CONTROL METHOD AND MEANS FOR PAVEMENTS AND BRIDGE DECK CONSTRUCTIONS

Alfred Marzocchi, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 19, 1977, Ser. No. 861,489
Int. Cl.³ E01C *3/00*
U.S. Cl. 404—28 **11 Claims**

11. A moisture-controlling membrane construction for disposition between a wear course and a concrete substrate of a pavement wherein the substrate embodies metal reinforcing members comprising a layer of asphalt, a body of electrically conducting material associated with the layer of asphalt, the body of current conducting material comprising an open mesh fabric of metal wires, each wire bearing a coating of glass, an

adhesive bonding the layer of asphalt to the substrate, and a source of electric energy connected with the body of current



conducting material and the metal members whereby to draw chloride ions of salt water which may filter into the substrate away from the metal reinforcing members.

4,319,855

HIGHWAY EXPANSION JOINT

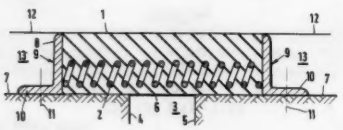
Reinhold Huber, Rorbas, Switzerland, and Waldemar Köster, Forsbach, Fed. Rep. of Germany, assignors to Kober AG, Glarus, Switzerland

Filed Mar. 29, 1979, Ser. No. 25,268

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1978, 2842171

Int. Cl.³ E01C *11/04*

U.S. Cl. 404—68 **25 Claims**



1. A vertical load bearing expansion joint assembly for sealing a gap in vehicular roadbeds and the like, comprising an elongated strip of elastomeric material having anchoring means along its side edges for fixedly connecting the same to the opposed sections of the roadbed across the gap in said joint, a plurality of helical coils embedded within and bonded to the elastomeric material of the strip to be conjointly movable therewith, said helical coils extending transverse to the longitudinal axis of said strip in parallel spaced relationship along the length of said strip, each of said helical coils being secured at its ends to the respective anchoring means so as to conjointly expand or contract with said strip corresponding to the movement of the roadbed sections and provide reinforcement for vertical load on said strip.

4,319,856

MICROWAVE METHOD AND APPARATUS FOR REPROCESSING PAVEMENTS

Morris R. Jeppson, Carmel, Calif., assignor to Microdry Corportion, San Ramon; Giselle V. Laurmann, Carmel, both of, Calif.; Richard R. Blurton and Claire M. Blurton, both of Incline Village, Nev., part interest to each

Continuation of Ser. No. 756,365, Jan. 3, 1977. This application Oct. 4, 1978, Ser. No. 948,503

Int. Cl.³ E01C *23/14*

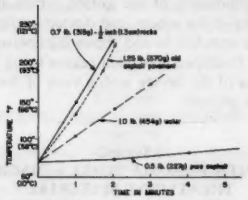
U.S. Cl. 404—79 **48 Claims**

1. A method for recycling existing asphalt pavement comprising the steps of:

establishing a microwave energy containment region above said pavement including positioning microwave energy emitting waveguide means in spaced apart relationship from said pavement to provide a gap enabling traveling of said waveguide means without direct contact with said pavement,

traveling said containment region along said existing asphalt pavement while concurrently generating heat within the interior of said pavement, to soften the asphalt content thereof, by directing microwave energy into said pavement from said containment region while traveling therealong, including distributing said microwave energy substantially uniformly across the width of a strip of said pavement over which said containment region is traveled,

suppressing outward propagation of microwave energy from said containment region through said gap while traveling along said pavement,


0.7 lb. (318g) - ½ inch limestone rocks
1.25 lb. (570g) old asphalt pavement
10 lb. (454g) water
0.5 lb. (227g) pure asphalt
TEMPERATURE
TIME IN MINUTES

subsequently remixing the constituents of said pavement while said pavement is in the softened state, and

recompacting the remixed pavement constituents substantially at the original location thereof to provide renewed pavement thereat.

4,319,857

VIBRATOR DEVICES IN A ROADROLLER

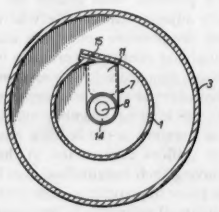
Lionel A. Reynolds, Maryhill, Cheltenham Rd., Painswick, Stroud, Gloucestershire, England

Division of Ser. No. 918,956, Jun. 28, 1978, Pat. No. 4,194,405. This application Oct. 17, 1979, Ser. No. 85,791

Claims priority, application United Kingdom, Jul. 23, 1977, 31037/77; Dec. 7, 1977, 50836/77

Int. Cl.³ E01C *19/28*

U.S. Cl. 404—117 **15 Claims**

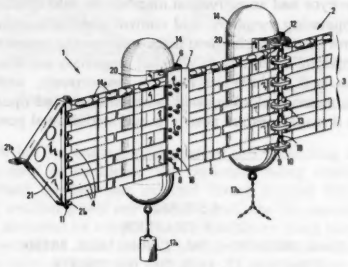


1. A vibratory road roller comprising a vibratory drum and a hydraulic vibrator device mounted coaxially with said drum, said vibrator device comprising a rotor mounted for rotation relative to said drum about the longitudinal axis of the drum, said rotor having a cavity open at a peripheral region of the rotor and adapted to contain a body of fluid which is eccentric of said axis, the rotor being surrounded by a swept annular surface fixed relative to said drum and so as to be contacted by and to contain said body of fluid in said cavity, and an out-of-balance mass to produce on rotation of the rotor a centrifugal force transmitted to said drum as a vibratory force by the pressure of said body of fluid on said swept annular surface.

4,319,858
HIGH RESISTANCE FLEXIBLE BOOM

Bernard Jaffrennou, Echirolles, and Maurice Cessou, Communay, both of France, assignors to Societe Anonyme ROLBA, Fontaine and Institut Francais du Petrole, Rueil-Malmaison, both of, France

Filed Oct. 16, 1979, Ser. No. 85,365
Claims priority, application France, Oct. 16, 1978, 78 29417; Dec. 1, 1978, 78 33932; Jul. 6, 1979, 79 17640
Int. Cl.³ E02B *15/04*
U.S. Cl. 405—68 **19 Claims**



1. A floating boom unit having a flexible structure comprising: a plurality of floats; at least one barrier associated with said plurality of floats for being supported thereby in a substantially vertical position; said at least one barrier comprising at least one armouring adapted for allowing the passage of water therethrough, and made up of plural transverse stiffening means connected along said armouring at spaced intervals and adapted for having said floats attached thereto for providing stability to the structure, and a plurality of traction resistant flexible transverse elements and a plurality of traction resistant flexible longitudinal elements interconnected, whereby said longitudinal elements are adapted to withstand substantially all the longitudinal loads resulting from traction when the boom is in use, and said longitudinal elements extending between the upper and lower edge of the boom for having said longitudinal loads distributed between said longitudinal elements; and said interconnection between said plurality of longitudinal elements and said plurality of transverse elements maintaining said longitudinal elements substantially uniformly spaced apart from each other throughout said intervals between said transverse stiffening means for having said longitudinal loads distributed in a balanced manner throughout said longitudinal elements.

4,319,859
DITCH LINING APPARATUS

James W. Wise, Woodleaf, N.C., assignor to Power Curbers, Inc., Salisbury, N.C.

Filed Apr. 21, 1980, Ser. No. 142,382
Int. Cl.³ E02B *5/02*; E01C *19/48*
U.S. Cl. 405—268 **14 Claims**

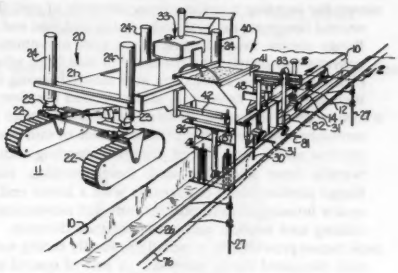
1. A self-propelled apparatus for extruding and forming a substantially U-shaped concrete lining within a previously dug ditch, characterized by the ability to form the concrete lining within the ditch while accurately controlling the slope of the interior bottom surface of the lining, and comprising the combination of:

(a) prime mover means for propelling said apparatus along the ground surface, said prime mover means including a frame and a plurality of rotatable drive members supporting said frame for movement over the ground surface,

(b) primary control means associated with said prime mover means for causing said prime mover means to follow a predetermined path of travel adjacent the ditch and to vertically adjust said frame relative to said rotatable members to maintain said frame moving at a predetermined elevation,

(c) a hopper carried by said frame and adapted to extend downwardly into the ditch for receiving the concrete material and for directing the same into the ditch,

(d) mold means supported on said frame and communicating with said hopper for receiving concrete material from said hopper and for molding the material into a substantially U-shaped lining within the ditch in covering relation to the bottom and sides thereof as the apparatus moves along the ground, said mold means including a forming member supported for vertical movement with respect to said frame, said forming member being substantially U-shaped in cross-section and defining with the sides and bottom of the ditch an extrusion opening through which the concrete material passes to form the U-shaped concrete lining in the ditch as said prime mover means moves along the ground, and

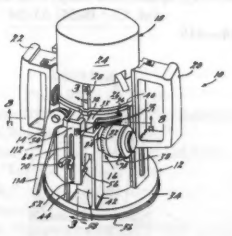


(e) secondary control means associated with said forming member for vertically adjusting the same relative to said frame and independently of the level of the bottom of the ditch, said secondary control means including forming member adjustment means for varying the vertical position of said forming member relative to said hopper so that the slope of the interior bottom surface of the concrete lining is accurately controlled as said prime mover means propels said apparatus along the ground surface and adjacent the previously dug ditch.

4,319,860
PLUNGE TYPE ROUTER

Allen G. Beares, Towson, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Feb. 29, 1980, Ser. No. 125,957
Int. Cl.³ B23C *1/20*; B27C *5/10*
U.S. Cl. 409—182 **8 Claims**



1. In a plunge type router including a motor housing having a driving motor provided therein including a driving shaft extending outwardly from the lower end thereof, said driving shaft being adapted to have a cutting tool secured thereto, a base housing having a work engaging flange portion and a main body portion extending upwardly therefrom, said main

body portion having a bore extending therethrough, said motor housing being supported within said bore and axially movable with respect to said base housing between a retracted position in which said cutting tool is positioned above said work engaging flange portion and an outwardly extended position in which said cutting tool projects below said work engaging flange portion a predetermined distance, improved means for selecting said predetermined distance and locking said driving motor in said extended position comprising:

first and second locking flange means projecting generally radially outwardly from said main body portion, said flange portions being positioned in circumferentially spaced relationship and in part defining an opening therebetween in a sidewall of said main body portion; and

means for exerting a pulling force on each of said first and second flange means to thereby move said first and second flange means toward each other, said movement being operative to restrict the diameter of said bore whereby a clamping force is exerted on said motor housing so as to lock said motor housing in said extended position;

a stop member including an axially elongated flange portion movably positioned on the outer surface of said main body portion and a stop flange portion extending radially inwardly from said elongated flange portion, said stop flange portion being engageable with a lower end of said motor housing so as to prevent outward movement of said cutting tool beyond said predetermined distance.

rack means provided on a radially inwardly facing surface of said elongated flange portion; a pair of spaced substantially parallel outwardly extending axially elongated guide flange portions provided on said main body portion, said elongated flange portion being positioned between said guide flange and said guide flange having opposed surfaces operative to guide axial movement of said stop means,

a rotatable shaft extending through aligned openings provided in each of said guide flange portions;

gear means provided on said rotatable shaft, said gear means being in meshing engagement with said rack whereby said rotatable shaft is operative to axially move said stop means; and

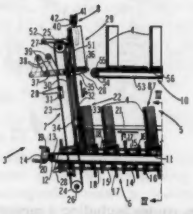
clamp means operative to clamp said stop means to said main body portion in a preselected position whereby said stop flange will operate to prevent outward movement of said cutting tool beyond said predetermined distance.

4,319,861

MAGAZINE-TYPE CIGARETTE FEEDING APPARATUSES FOR A CIGARETTE PACKAGING MACHINE

Enzo Seragnoli, Bologna, Italy, assignor to G.D Societa per Azioni, Bologna, Italy

Filed Feb. 21, 1980, Ser. No. 123,476
Claims priority, application Italy, Feb. 28, 1979, 3337 A/79
Int. Cl.³ B65G *65/04*
U.S. Cl. 414—419 **6 Claims**



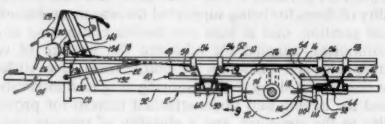
1. In an apparatus for feeding cigarette magazines to a packaging machine comprising a device for overturning said magazines inside the feed hopper of said packaging machine, a monitoring device for monitoring the level of cigarettes inside said hopper for controlling said overturning device, an intermittent main compartmented conveyor for feeding said magazines to a withdrawal position, and transfer units for transferring individual full magazines from said withdrawal position to said overturning device and individual empty magazines from said overturning device to a magazine discharging conveyor, the improvements comprising synchronising and operating members, governed by said monitoring device, for synchronising and operating said transfer units and a detecting element for detecting the presence of said magazines in said withdrawal position comprising a control member for said intermittent main conveyor and an activation member for said synchronising and operating members, said control member causing the drive motor of said intermittent main conveyor to operate or to cease to operate according to whether magazines are absent or present in said withdrawal position respectively, and said activation member blocking said synchronising and operating members if magazines are absent in said withdrawal position.

4,319,862

BOAT TRAILER

Leslie J. Cook, 25686 Wick Rd., Taylor, Mich. 48180

Filed Sep. 17, 1980, Ser. No. 188,078
Int. Cl.³ B60P *3/10*
U.S. Cl. 414—471 **12 Claims**

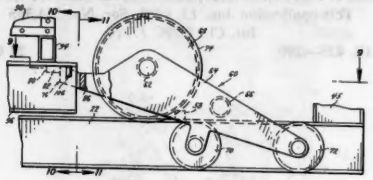


1. A boat trailer comprising a main frame having a pair of horizontally extending and laterally spaced side members connected together at their forward ends, said side members each having a stub axle thereon on which a ground-engaging wheel is journalled, a boat supporting frame having a longitudinally extending center support beam and a pair of longitudinally spaced transverse support beams mounted on said center beam, said transverse beams being located one ahead and one behind the ground-engaging wheels, said main frame and said boat supporting frame having a plurality of pulleys at each side thereof journalled for rotation about horizontal axes, cables extending lengthwise of the trailer at each side thereof and trained around said pulleys, said cables having rear ends anchored to one of said frames and having their forward ends connected to a winch so that the cables can be reeled in and out to vary the effective length thereof between the anchored ends and said winch, said boat supporting frame being suspended from said main frame by said cables and pulleys such that the boat supporting frame can be tilted in an fore and aft direction relative to said main frame by raising and lowering the front or rear ends of the boat supporting frame, means for releasably pivotally connecting the front end of the boat supporting frame with the front end of the main frame so that, when said frames are so pivotally connected and the cable means are reeled out, the boat supporting frame tilts downwardly about its front end as an axis and, when said frames are pivotally unconnected and the cable means are reeled out, the boat supporting frame can be lowered to ground level relative to the main frame, said main frame being unobstructed between said side members to permit the front end of the boat frame and the boat supported thereon to tilt upwardly on said main frame to at least about the level of the front end of the main frame and to permit the rear end of the boat frame and the boat supported thereon to tilt downwardly on the main frame to a level below the ground on which the wheels are supported.

4,319,863
GRAIN TRAILER AND BIN

Kenneth Voges, R.R. 2, Red Bud, Ill. 62278

Division of Ser. No. 876,360, Feb. 6, 1978. This application Jul. 9, 1979, Ser. No. 55,531
Int. Cl.³ B60P 1/04
U.S. Cl. 414—480 10 Claims

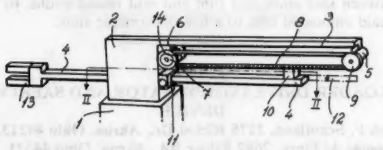


1. A bin for storing, transporting and protecting materials comprising an enclosure, the enclosure being reinforced to withstand internal and external forces applied thereto and being weather proof and vermin proof, the bin superstructure being mounted on a support and the support being mounted on and connected to a set of parallel beams, and wherein the beams have downwardly extending catch pins at their forward extremities for cooperating with and being retained by an attaching structure whereby the bin may be mounted on a trailer, the catch pins extending from upper portions of the beams and being engageable and retainable by cooperating trailer structure, the beams having latch pins at the rearward portions of the beams for engaging a cooperating stop on a trailer mechanism to prevent rearward displacement of the bins from the trailer, when mounted thereon.

4,319,864
APPARATUS FOR PRODUCING RAPID MOVEMENT AND SMOOTH BRAKING AND A PRECISELY DEFINED FINAL POSITION OF A MOVABLE ROBOT ARM

Roland Kaufeldt, Bovägen 6, S-135 00 Tyresö, Sweden

Filed Feb. 19, 1980, Ser. No. 122,369
Claims priority, application Sweden, Feb. 21, 1979, 7901531
Int. Cl.³ B25J 11/00
U.S. Cl. 414—750 2 Claims



1. Apparatus for producing rapid movement and smooth braking and a plurality of reproducible and precisely defined final positions of a movable robot arm, said apparatus comprising

(a) a support arm,

(b) a rapidly rotatable motor, said rapidly rotatable motor being carried by said support arm,

(c) a first gear, said gear being connected to said rapidly rotatable motor,

(d) a slowly rotatable motor, said slowly rotatable motor also being carried by said support arm,

(e) a second gear,

(f) a coupling, said second gear being connected to said slowly rotatable motor over said coupling,

(g) a substantially elongate driving belt, said driving belt extending between said two gears,

(h) a movable robot arm, said movable robot arm being attached to said driving belt and extending parallel thereto,

(i) a stationary arm, said stationary arm extending substantially parallel to said robot arm and said driving belt, respectively,

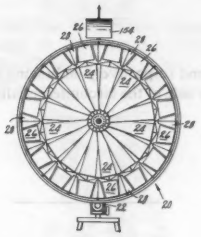
(j) a sensing member, said sensing member being disposed on said robot arm, and

(k) a plurality of transmitting members, said transmitting members being disposed on said stationary arm for interacting with said sensing member.

4,319,865
WINDMILL

Joseph G. Richard, 357 South St., Hyannis, Mass. 02601

Filed Jun. 20, 1979, Ser. No. 50,169
Int. Cl.³ F03D 7/04
U.S. Cl. 416—41 7 Claims



1. A windmill assembly including a wind wheel comprising a central hub formed with spaced apart front and rear flanges, a plurality of sub-assembly segments each generally in the form of a circular sector adapted to being assembled around the hub with similar segments to form a complete wheel assembly and each including a bridge connected to the bridges of adjacent segments and having front and rear edges oriented in the wheel assembly, a radial support extending from the hub and passing through a fitting on the bridge, an adjustably fixed blade mounted on the radial support and a primary movable vane pivotable on an axis in alignment with the radial support, laterally and radially adjustable means for securing the segments to the hub, the wind wheel further comprising a speed sensing mechanism including a plurality of interconnected weights each mounted on an arm pivoted for movement toward and away from the axis in the plane of the wheel, whereby speed related movement of the weights is translated into orientation of the vanes to reduce their torque input from the vanes to the wheel as wheel speed increases.

4,319,866
FAN

C. Paul Kolthoff, Naperville, Ill., assignor to International Harvester Company, Chicago, Ill.

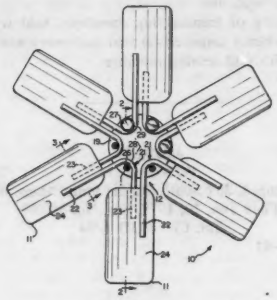
Filed Jan. 22, 1980, Ser. No. 114,436
Int. Cl.³ F04D 29/34
U.S. Cl. 416—210 R 12 Claims

1. A fan blade assembly, comprising:

a plurality of fan blades circumferentially spaced about a central rotational axis; and

a plurality of rod members equal in number to the plurality of fan blades, each rod member bent intermediate the ends thereof forming first and second arms bridged by an arch, the bent rods circumferentially spaced about the central rotational axis with the arches converging toward the central rotational axis and the first arms extending radially outwardly and respectively embracing one side of the

circumferentially spaced fan blades and the second arms extending radially outwardly substantially parallel to the



first arms and respectively embracing a second side opposite the one side of the circumferentially spaced fan blades.

4,319,867

END-FACE SEAL FOR ROTARY INTERNAL-COMBUSTION ENGINE

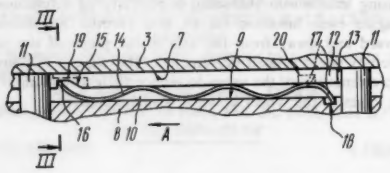
Vladimir N. Koshelev, ulitsa Revoljutsionnaya, 42/203, kv. 943; Vyacheslav Meshkov, ulitsa Lunacharskogo, 8, kv. 371, and Boris V. Chaplanov, ulitsa Dzerzhinskogo, 77, kv. 172, all of Tolyatti, Kuibyshevskoi oblasti, U.S.S.R.

Filed May 3, 1979, Ser. No. 35,459

Claims priority, application U.S.S.R., May 4, 1978, 2615607

Int. Cl.[3] F01C *19/04, 19/08*

U.S. Cl. 418—113 **4 Claims**



1. An end-face seal for the rotary internal-combustion engine the rotor whereof is contained in the working chamber formed by the engine housing and its end walls, said end-face seal comprising seal elements located at the apexes of said rotor, grooves running in the end faces of said rotor at the periphery thereof between said seal elements, seal strips received pairwise within each of said grooves; each seal strip extending substantially the entire length of its respective groove, said seal strips resiliently pressed to the working surfaces of said end walls of said engine housing, one of said seal strips received within each of said grooves is resiliently pressed to one of said seal elements which leads said seal strip when said rotor is set rotating, the resilient pressing of said seal strip being accomplished by action of a spring member directly on to said seal strip.

4,319,868

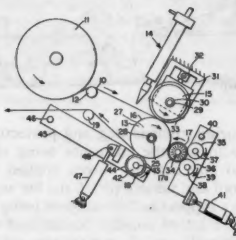
APPARATUS FOR EMBOSSING AND PERFORATING A RUNNING RIBBON OF THERMOPLASTIC FILM ON A METALLIC PATTERN ROLL

Coenraad E. Riemersma, and Theodore P. Merz, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 967,194, Dec. 7, 1978, Pat. No. 4,272,473. This application Jan. 12, 1981, Ser. No. 224,355

Int. Cl.[3] B29C *17/14*

U.S. Cl. 425—290 **21 Claims**



1. Apparatus to produce an embossed thermoplastic film and to perforate the tips of the bosses thereof, comprising:

(a) means to supply a heated continuous thermoplastic film;

(b) a male patterned embossing roll having a multiplicity of raised knobs defining a peripheral surface on said embossing roll;

(c) means to conform a thermoplastic film to the raised knobs of the male patterned embossing roll thereby producing an embossed film havng a multiplicity of raised bosses;

(d) heated perforating surface means contacting the portions of the film conformed to said peripheral surface of said knobs to melt and extrude said film from between the perforating and peripheral contacting surfaces thereby forming perforations in the film on said peripheral surface and simultaneously forming a grommet-like reinforcing rim around each perforation; and

(e) means, while maintaining registration and contact between said embossed film and said raised knobs, to cool said embossed film to a less deformable state.

4,319,869

LOADER DRIVE COMPENSATOR AND SAFETY DEVICE

Joseph F. Scantland, 2275 Rickel Dr., Akron, Ohio 44313, and Thomas A. Flory, 2682 Kibler Rd., Akron, Ohio 44321

Filed May 1, 1980, Ser. No. 145,444

Int. Cl.[3] B29D *29/00*

U.S. Cl. 425—38 **6 Claims**

1. In combination, a fluid pressure supply means and a loader safety device for a tire curing press including a frame having a pair of vertically extending side members and a top member secured to and extending between said side members, and a support platform operatively mounted on said side members for vertical movement therealong and mounting tire loader means thereon and characterized by

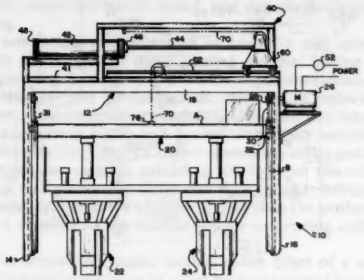
a cylinder having a blind end and an operative end with a piston rod extending from its operative end, said cylinder being operatively secured to said frame top member, said pressure supply means connecting to the blind end of said cylinder,

a carriage mounted for movement along said top member and engaging said piston rod which controls the position of said carriage,

a flexible support means, operatively anchored at one end in relation to said frame, engaging a rotatable means mounted on said carriage and extending to and engaging

said support platform to support the same whereby said cylinder can control the position of said support platform on said side members and,

a drive system means for moving said support platform



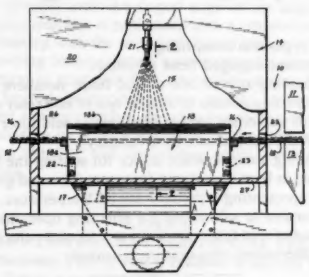
vertically of said side members, a normally closed pressure operated switch connected to said supply means; and said switch being connected to said drive system means to prevent drive thereof when the pressure in said supply means is below a predetermined value.

4,319,870

APPARATUS FOR THE MANUFACTURE OF FIBROUS WEBS

Frank M. Slama, Appleton, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Aug. 27, 1979, Ser. No. 70,001
Int. Cl.³ B29D *7/00*
U.S. Cl. 425—83.1 **6 Claims**



1. In an apparatus for the m anufacture of fibrous webs, comprising a linearly movable forming wire, means for directing a dispersion of dry fibers in air onto one side of said forming wire in formation of a dry-laid fibrous web thereon, a suction box having an opening over which there extends a side of said forming wire opposite said one side and operative to draw said dispersion onto said forming wire for passage of air therethrough and deposit of fibers thereon to form said web, said forming wire and said suction box opening having substantially mutually aligned, opposite edge portions extending in the direction of movement of said forming wire, and means for spraying binder material onto said web as it is moved over the opening of said suction box, the improvement comprising:

a pair of baffle means, each in confronting, closely spaced relationship to one of said mutually aligned opposite said edge portions of said forming wire and said suction box opening,

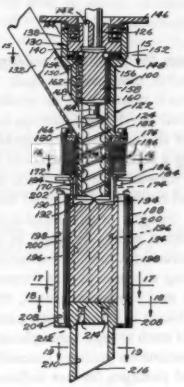
said baffle means and said edge portions being so cooperatively disposed as to define paths for suction box-induced, upwardly directed flows of ambient air therebetween and onto said web to entrain binder material in the region of said edge portions and to direct said material onto said web.

4,319,871

APPARATUS FOR EXTRUDING A THERMOPLASTIC MATERIAL

Roy E. McAlister, 5285 Red Rock North, Phoenix, Ariz. 85108

Filed Apr. 23, 1979, Ser. No. 32,635
Int. Cl.³ B29F *3/02, 3/08*
U.S. Cl. 425—376 R **11 Claims**



1. Apparatus for extruding a thermoplastic material comprising a barrel section,

a relatively short longitudinally extending screw section rotatably mounted in said barrel section,

means for rotating said screw section within said barrel section about a longitudinally extending axis,

said rotating means comprising an electric motor having an output shaft, said screw section including a shaft portion journaled in said barrel section and torque limiting coupling means between said output shaft and said shaft portion,

means for feeding a supply of solid particles of thermoplastic material into said barrel section to be compressively engaged and moved longitudinally from said barrel section by the rotation of said screw section,

a nozzle assembly having passage means for receiving the compressed solid thermoplastic particles moving from said barrel section and directing the same to move out of a spaced extrusion outlet therein,

means for heating the solid plastic particles during the movement thereof through said passage means, and

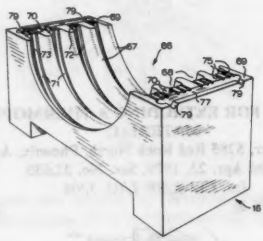
means for preventing the heat added by said heating means from being transmitted to the solid particles in said barrel section to a degree sufficient to cause the same to melt so that said screw section compressively engages and moves the plastic material in solid particle form only and is free from contact with molten plastic material.

4,319,872

APPARATUS FOR PRODUCING THERMOPLASTIC TUBING

Gerd P. H. Lupke, 46 Stornoway Crescent, and Manfred A. A. Lupke, 35 Ironshield Crescent, both of Thornhill, Ontario, Canada

Continuation-in-part of Ser. No. 855,409, Nov. 28, 1977, Pat. No. 4,199,314. This application Apr. 21, 1980, Ser. No. 142,015
Claims priority, application Canada, Dec. 1, 1976, 266970
Int. Cl.[3] B29C *17/07*; B29D *23/04*
U.S. Cl. 425—532 5 Claims



1. In an apparatus for producing corrugated thermoplastic tubing, the apparatus comprising a pair of complementary mold assemblies each comprising an endless chain of articulately interconnected mold blocks driven in synchronism with the mold blocks of the other mold assembly along a forward run and back along a return run, the mold blocks cooperating in pairs along said forward run to provide an axially extending tubular mold tunnel having a corrugated wall defined by alternating crests and troughs in the mold-defining faces of the mold blocks, extrusion means disposed at the entrance to the mold tunnel for extruding a tube of thermoplastic material, and means for expanding the tube as it is formed to urge the tube outwardly against said corrugated wall, the improvement in which each mold block is formed with passages communicating with the base of each trough throughout the length thereof and comprising continuous grooves extending along the bases of the troughs, said passages further defining ports communicating with the exterior of the mold block, wherein said grooves extend along the bases of the troughs at the corners thereof.

4,319,873

FLAME DETECTION AND PROOF CONTROL DEVICE

Roger P. Michaud, Lewiston, Me., and Douglas B. Campbell, deceased, late of Gilford, N.H. (by Diane Campbell, administratrix), assignors to American Stabilis, Inc., Lewiston, Me.

Filed Apr. 12, 1979, Ser. No. 29,572
Int. Cl.[3] F23N *5/00*
U.S. Cl. 431—24 12 Claims

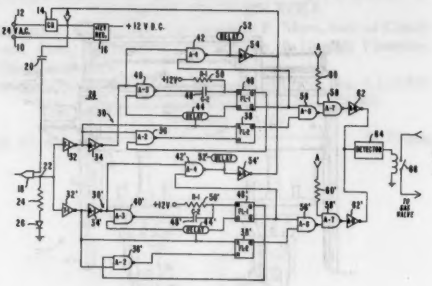
1. A control device for use in a gas-fired system connected to a power source, said control device comprising:

a probe indicating the presence of a flame in said gas-fired system;

circuit means connected to said probe and including two flip-flops, a first flip-flop indicating the presence of an ignition period and a second flip-flop indicating the presence of a flame in said gas-fired system, said circuit means producing a first output signal when said flip-flops are indicating the presence of either an ignition period or a flame, and producing a second output signal at all other times;

a gas valve; and

relay means operatively connected to said gas valve and used to control the supply of gas in said gas-fired system,



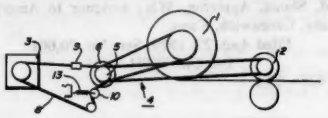
said relay means being connected to said circuit means and only being activated by said first output signal.

4,319,874

FUSER APPARATUS AND CONTROL THEREFORE

Takashi Sawano, Ebina, Japan, assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 28, 1980, Ser. No. 201,119
Int. Cl.[3] F27B *9/28, 1/26, 9/40*
U.S. Cl. 432—60 13 Claims



1. Fuser apparatus comprising:

a pair of pressue engaged fuser members;

means for heating at least one of said fuser members;

means of imparting motion to at least one of said fuser members at different velocities, said at least one of said fuser member being initially moved at a first velocity;

means including a temperature sensor for sensing the temperature of said at least one of said fuser members and generating a signal representing a predetermined temperature; and

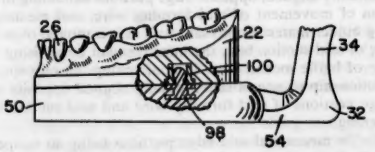
means responsive to said signal for effecting operation of said at least one of said fuser members at a second velocity when said predetermined temperature is sensed.

4,319,875

DETACHABLE FASTENER FOR JOINING IMPRESSIONS OF A MOUTH ONTO A DENTAL ARTICULATOR

Edward K. Beckwith, 303 La Marina, Santa Barbara, Calif. 93109

Filed Nov. 17, 1980, Ser. No. 207,297
Int. Cl.[3] A61C *11/00*
U.S. Cl. 433—60 12 Claims



1. A detachable fastener for joining impressions of a mouth formed of a lower mouth model and upper mouth model onto

a dental articulator having a base member which is adapted to support the lower mouth model and a top member which is adapted to support the upper mouth model and wherein each member has a layer of cured binding material formed thereon adjacent its respective mouth model, said detachable fastener comprising

a first connecting means located in one of a said mouth model and a layer of cured binding material having an annular shaped connecting collar having a predetermined axial length and predetermined diameter, a spherical shaped joining member extending axially from one side of said connecting collar and having a diameter which is greater than the diameter of the connecting collar and an enlarged base member extending axially from the other side of said connecting collar, said base member having a geometrical dimension which is greater than the predetermined diameter of the annular shaped connecting collar; and

a second connecting means located in the other of a said mouth model and a layer of cured binding material having a socket housing formed of an elongated, thin walled tubular member and having an opening at one end thereof which extends into the interior of the socket housing, said socket housing having an interior dimension which is at least equal to the sum of the diameter of said spherical shaped joining member and the axial length of the connecting collar, said socket housing including means for defining an annular shaped alignment and gripping member adjacent the opening, said alignment and gripping member having a sloped edge which extends from the edge of the opening inwardly toward the interior of the socket housing a distance substantially equal to the axial length of said connecting collar, said socket housing being adapted to have a said spherical shaped joining member and said connecting collar inserted into said opening wherein said spherical shaped joining member is directed into engagement with and past said alignment and gripping member until the sloped edge of the alignment and gripping member is positioned into a removable gripping relationship with the spherical shaped joining member and connecting collar wherein a separating force applied in a direction to urge said first connecting means away from said second connecting means results in the spherical shaped joining member abruptly overriding said gripping relationship to permit separation of the spherical shaped joining member and connecting collar from the socket housing.

4,319,876

AUXILIARY INSTRUMENT FOR DENTAL TREATMENT

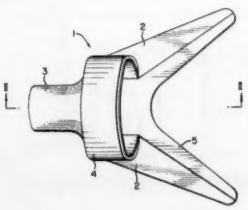
Hiroshi Muraoka, Tokyo, Japan, assignor to Katumi Takahashi, Tokyo, Japan, a part interest

Filed Jul. 14, 1980, Ser. No. 167,755

Claims priority, application Japan, Jul. 23, 1979, 54-93525; Oct. 17, 1979, 54-142720

Int. Cl.³ A61C *31/00*

U.S. Cl. 433—141 **2 Claims**



1. An auxiliary instrument for dental treatment which comprises a forked mandible retaining plate with a surface for abutting the face under the mandible and extending under the mandible on opposite sides, a protruding mandible head retaining means extending from the plate in the vicinity of a forked base end portion thereof, said means having a through opening into which the head of the mandible is inserted, a flexible substance removably carried on the surface of said mandible retaining plate and on an inside peripheral surface of said mandible head retaining means that forms said through opening and means for gnipping said instrument to guide said mandible.

4,319,877

PALLADIUM-BASED DENTAL ALLOY CONTAINING INDIUM AND TIN

Benjamin K. Boyajian, 309 Alderman Rd., Charlottesville, Va. 22903

Continuation-in-part of Ser. No. 83,344, Oct. 10, 1979, Pat. No. 4,261,744. This application Aug. 21, 1980, Ser. No. 180,143

The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.

Int. Cl.³ A61K *6/04*; C22C *5/04*

U.S. Cl. 433—207 **11 Claims**

1. An alloy, free of gold or silver, consisting essentially of 75–85% by weight of Pd, 5–10.5% by weight of In, 5–10.5% by weight of Sn, 0.2–0.7% by weight of Ru, up to 7.5% by weight of Co, Cr or Ni and up to 0.25% by weight of Si.

4,319,878

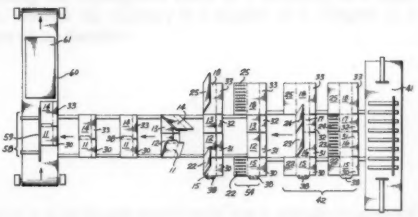
METHOD AND APPARATUS FOR FORMING A REINFORCED HALF-SLOTTED CONTAINER

Henry L. Dozier, Brandon, and John C. Williamson, Sessner, both of Fla., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Sep. 18, 1979, Ser. No. 76,640

Int. Cl.³ B31B *1/36, 1/54*

U.S. Cl. 493—131 **20 Claims**



1. A method of forming a reinforced half slotted container from a container blank in which each of the side walls is formed by an outer side wall and a reinforcing panel attached to said outer side wall along a score line at the top of said outer side wall, said panels and outer side walls comprising an exterior pair along the side edges of said blank and an interior pair of panels and walls between said exterior pair, comprising

applying adhesive to one of said reinforcing panels or said outer side walls of one of said exterior or interior pairs of panels,

folding said reinforcing panels of said one pair onto said outer side wall with said adhesive between said reinforcing panels and said outer side walls and adhering said reinforcing panels to said outer side walls,

applying adhesive to one of said reinforcing panels or outer side walls of said other pair of said interior or exterior pairs of panels,

folding said reinforcing panels of said other pair onto said outer side walls with said adhesive between said reinforcing panels and said outer side walls, and

adhering said reinforcing panels to said outer side walls.

4,319,879

METHOD FOR MODIFYING WOOL FIBER MATERIALS TO ADVANCE QUALITY GRADE THEREOF

Hiroshi Hojo, 59-1, Aza Fumizoe, Osza Ryodakaya, Konan-Shi, Aichi 483, and Sadao Noguchi, 85, Narukocho, 4-Chome, Midori-Ku, both of Japan

PCT No. PCT/JP79/00220, § 371 Date May 1, 1980, § 102(e) Date Apr. 25, 1980, PCT Pub. No. WO80/00580, PCT Pub. Date Apr. 3, 1980

PCT Filed Aug. 17, 1979, Ser. No. 198,946

Claims priority, application Japan, Sep. 1, 1978, 53-107949

Int. Cl.³ D06M *3/02, 13/00*

U.S. Cl. 8—128 R 5 Claims

1. A method for modifying wool fibers to advance the quality grade thereof which comprises:

(a) dipping a wool fiber material in a saturated solution of a neutral salt of a strong electrolyte and an acid, whereby the acid is included in the edge portions of the endo cuticles of the scales of the wool fiber;

(b) dipping the wool fiber material in a saturated aqueous solution of the neutral salt having a pH in the neutral range or in water, the aqueous solution or the water containing a compound selected from the group consisting of sodium hypochlorite, sodium chlorite and chlorocyanuric acid salt and mixtures thereof, to effect gradual chlorination of the wool fibers;

(c) removing the liquid from the so-treated wool fiber material;

(d) dipping the wool fiber material in water to swell the chlorinated portions;

(e) washing with water to remove the chlorinated portions; and

(f) contacting the resulting wool fiber material with a solution containing sodium pyrosulfite and an alkaline liquid to provide wool fibers having a smooth surface.

4,319,880

MONOAZO DYESTUFF BEING STABLE UNDER DYEING CONDITIONS; ITS MANUFACTURE AND ITS USE

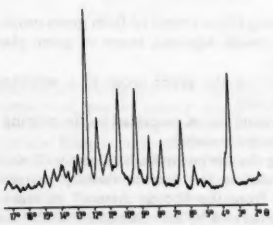
Konrad Opitz, Liederbach, and Rudolf Schickfluss, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 23, 1980, Ser. No. 152,552

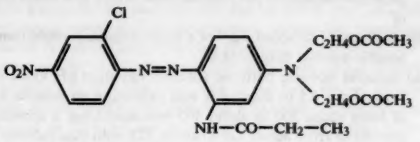
Claims priority, application Fed. Rep. of Germany, May 25, 1979, 2921210

Int. Cl.³ C09B *67/00;* D06P *67/02*

U.S. Cl. 8—526 1 Claim



1. The modification β being stable under dyeing conditions of the dyestuff of the formula



being characterized by an X-ray diffraction pattern as shown in FIG. 1 with characteristic reflexes at the following glance angles Θ with the relative intensities:

Θ	3.71	6.62	7.85	8.6	9.43	10.51	11.8	12.57
relative intensity	67	44	34	36	60	60	46	100

4,319,881

PROCESS FOR PRINTING OR PAD DYEING OF TEXTILE MATERIAL MADE FROM CELLULOSE FIBRES, OR FROM MIXTURES THEREOF WITH SYNTHETIC FIBRES

Zdenek Koci, Binningen, and Andres Schaub, Biel-Benken, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

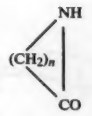
Filed Oct. 30, 1980, Ser. No. 202,082

Claims priority, application Switzerland, Nov. 5, 1979, 9908/79

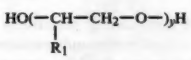
Int. Cl.³ D06P *3/82*

U.S. Cl. 8—532 23 Claims

1. A process for printing or pad-dyeing textile material made from cellulose fibers, or mixtures thereof with synthetic fibers, comprising the steps of impregnating the fibers, either simultaneously or successively, with (i) an aqueous dispersion of at least one dye which is difficultly soluble or insoluble in water and (ii) an aqueous solution of an auxiliary, and subsequently subjecting the impregnated fibers to a dye-fixing heat treatment, wherein the auxiliary is a mixture or a complex of a lactam of the formula



wherein n is an integer from 3 to 6, and a polyalkylene glycol of the formula



wherein R_1 is hydrogen, methyl or ethyl, and y is an integer from 3 to 25.

4,319,882

METHOD FOR DETECTING IMMUNOLOGICAL AGGLUTINATION AND BIOCHEMICAL AGENT THEREFOR

Yash Sharma, 2766 January Cts., Falls Church, Va. 22043

Filed Feb. 21, 1980, Ser. No. 123,432

Int. Cl.³ G01N *33/54, 33/80*

U.S. Cl. 23—230 B 7 Claims

1. A biochemical agent comprising a solution of from about 0.1 to about 1.0 g/l of a nonionic surface-active agent selected from the group consisting of water soluble

protein-compatable polyoxyalkylene ethers and esters and of

from about 0.1 to about 1 g/l of a water soluble protein-compatable anionic detergent in

an aqueous isotonic buffered solution having a pH value of from about 6.5 to about 8.0; and exhibiting an osmolarity of from about 300 to about 400 milliosmol/kg, a sodium-contact of from about 125 to about 225 milli-equivalents/1 and a potassium content of from about 3.5 to about 7.5 milli-equivalents/1.

6. A method for detecting immunological agglutination in a liquid suspension, which comprises the steps of

(a) mixing a liquid suspension comprising agglutinogen-containing agglutinable matter suspended therein with a reagent containing agglutinins reactive towards the agglutinogen-content of the agglutinable matter to obtain a reaction mixture;

(b) allowing a period of time suitable for an immunological reaction to take place;

(c) mixing the reaction mixture with the biochemical agent as defined in claim 1 to obtain a diluted reaction-mixture; and

(d) examining the diluted reaction mixture for unagglutinated subject matter suspended therein.

4,319,883

METHOD FOR DETERMINING CATECHOLIC COMPOUNDS AND THEIR RELATED COMPOUNDS

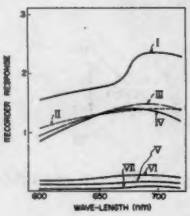
Kazuhiro Imai; Shigemitsu Yamada, both of Tokyo; Hidehiro Kubota, Kawasaki, and Jun Sakamaki, Kasukabe, all of Japan, assignors to ATTO Corporation, Tokyo, Japan

Filed Mar. 26, 1980, Ser. No. 133,977

Claims priority, application Japan, Mar. 30, 1979, 54-36911

Int. Cl.³ G01N *33/52, 21/25*

U.S. Cl. 23—230 B **3 Claims**



1. A method of determining selectively catecholic compounds and their related compounds contained in a substance which also contains mono-phenolic compounds, comprising reacting said substance simultaneously or consecutively with solutions of ferric chloride and potassium ferricyanide as reaction reagents for such a reaction period and in such concentrations of the solutions of the reaction reagents that the reaction products of the catecholic compounds or their related compounds with the reaction reagents will exhibit absorbances sufficiently higher than the reaction products of the mono-phenolic compounds when analyzed by spectrophotometry at the wavelength of 600 to 700 nm to enable selective determination of the catecholic compounds and their related compounds in the presence of the mono-phenolic compounds, and analyzing, after the reaction is completed, the reaction products by spectrophotometry at the wavelength of 600 to 700 nm so as to determine the catecholic compounds and their related compounds.

4,319,884

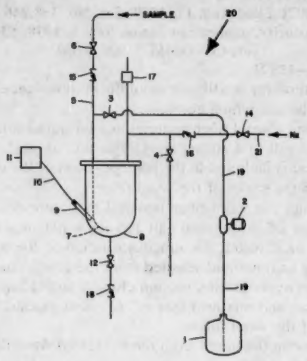
AUTOMATIC COLORIMETRIC ANALYZER

Darlene Wilson; Emmett J. Brown, Jr., both of Baton Rouge, and Lawrence J. Landry, Jr., Donaldsonville, all of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 22, 1980, Ser. No. 218,887

Int. Cl.³ G01N *21/78, 21/27*

U.S. Cl. 23—230 R **8 Claims**



3. An automatic colorimetric method for quantitatively determining trace concentrations of a component in a sample, comprising the steps of:

(a) automatically measuring and controlling the quantities of sample analyzed and reagent used for color development;

(b) turbulently mixing the sample and reagent by the rapid and forceful injection, in a mixing chamber, of the sample below the liquid level of the reagent, thereby forming a colored solution wherein the intensity of the color determines the concentration of the component in the sample; and

(c) measuring the intensity of the color with a probe colorimeter positioned in the mixing chamber below the liquid level.

4,319,885

COAL FUEL MIXTURE RESULTING IN REDUCED SULFUROUS POLLUTANTS

Melvin H. Brown, Freeport, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 8, 1980, Ser. No. 185,176

Int. Cl.³ C10L *9/00*

U.S. Cl. 44—15 R **8 Claims**

1. A method of reducing sulfurous pollutants from furnaces fired with sulfur-containing coals, the method comprising the steps of:

(a) recovering fibrous material from green crops, comprising leaves, grasses, legumes, stems of green plants and tree leaves by:

(i) subjecting the green crops to a mechanical pulping action; and

(ii) separating juices generated by the pulping action from the fibrous material;

(b) burning the fibrous material along with said sulfur-containing coal in the furnace thereby permitting alkaline residues from the fibrous material to react with sulfur oxides generated by the combustion of the coal, said reaction converting said oxides to sulfur salts and permitting the salts to be recovered in ash from the furnace thereby reducing the pollutants from said furnace by the reaction and by dilution of the combustion gases.

4,319,886

DENATURANTS FOR ETHYL ALCOHOL

Marvin H. Gold, 5050 Dory Way, Fair Oaks, Calif. 95628, and Joseph Winkler, 4291 N. River Way, Sacramento, Calif. 95825

Filed Jan. 7, 1980, Ser. No. 109,862
Int. Cl.³ C10L 1/18
U.S. Cl. 44—53 12 Claims

1. A process for rendering commercial ethyl alcohol denatured and non-potable which comprises, adding to ethyl alcohol, at least one denaturing compound selected from the group consisting of C_1 to C_5 lower alkyl esters of naphthenic acids and mixing said compound with said alcohol to form a miscible mixture.

4,319,887

DISTILLATE FUEL ADDITIVES

Paul Lurix, Bernardsville, N.J., assignor to Keyline Research & Development Corporation, Rutherford, N.J.

Filed May 7, 1980, Ser. No. 147,587
Int. Cl.³ C10L 1/22
U.S. Cl. 44—72 8 Claims

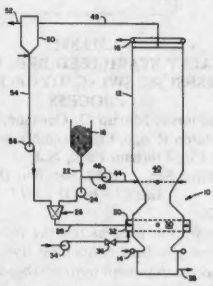
1. A mixture of a distillate fuel and a distillate fuel additive, said additive comprising: a homogeneous mixture of a decahydronaphthlene dispersant in an amount effective to inhibit coagulation and agglomeration of the fuel molecules, thereby impeding the formation of varnishes and gums and promoting the more efficient combustion of the fuel; a barium amine complex combustion modifier in an amount effective to inhibit the formation of free carbon during the combustion of said fuel and to catalyze the oxidation of said carbon; an effective amount of a pour point depressant which is an ethylene-vinyl acetate copolymer; and a liquid hydrocarbon carrier which is a kerosene, a No. 1 or No. 2 diesel fuel, or a No. 2 fuel oil.

4,319,888

APPARATUS FOR MIXING CHAR-ASH INTO COAL STREAM

Henry J. Blaskowski, Avon, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 12, 1980, Ser. No. 215,779
Int. Cl.³ C10J 3/30
U.S. Cl. 48—77 2 Claims



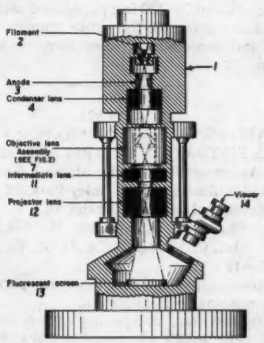
1. Apparatus for generating low BTU gas from coal, including an entrained coal gasifier having means defining a first combustion zone, means defining a second reductor zone, a plurality of burners firing into the combustion zone, means for introducing combustibles, in the form of mixed coal and char, and oxygen to the combustion zone under substantially stoichiometric condition, means for introducing coal to the reductor zone under substoichiometric conditions, the reductor zone being located such that the hot gases from the combustion zone pass through the reductor zone, generating low BTU gas and char therein, means through which the low BTU gas and the char are discharged from the coal gasifier, means for separating the char from the low BTU gas, riffle plate means, the riffle plate means having an inlet end and an outlet end, the outlet end being connected to the burners, means for introducing char to one side of the inlet end, means for introducing coal to the other side of the inlet end, said riffle plate means including a plurality of first plates secured at the inlet end of the riffle plate means to said one side, and a plurality of second plates secured at the inlet end to said other side, the other ends of both said first and second plates extending inwardly and in a downstream direction to a point past the central axis of the riffle plate means, said first and second plates being of such number that they extend across and cover a major portion of the entire cross-section of the riffle plate means, the first and second plates running alternately with each other, so that their other ends are inter-nested, and thus, the first plates direct a portion of the char towards said other side of the riffle plate means, and the second plates direct a portion of the coal towards said one side of the riffle plate means, so that the coal and char flowing to the burners is thoroughly mixed or blended together.

4,319,889

ULTRASHARP DIAMOND EDGES AND POINTS AND METHODS OF MAKING SAME BY PRECISION MICRO-IRRADIATION TECHNIQUES

Humberto F. Villalobos, 55 Dartmouth Rd., Williams Bay, Wis. 53191

Continuation-in-part of Ser. No. 63,685, Aug. 6, 1979, which is a continuation of Ser. No. 852,022, Nov. 16, 1977, Pat. No. 4,164,680. This application Feb. 13, 1980, Ser. No. 121,106
Int. Cl.³ B24D 3/02, 3/04
U.S. Cl. 51—307 15 Claims



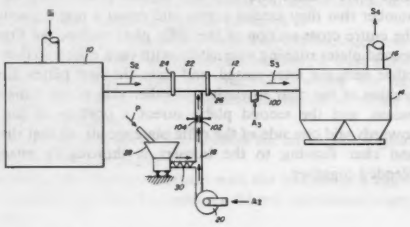
1. A method of making ultrasharp diamond edges and points which comprises forming a diamond edge or point having a radius less than 0.01 micron, positioning said diamond edge or point in a sealed enclosure, reducing the temperature in said enclosure to a temperature in the range of −50° C. to −272° C., and the pressure in said enclosure to a pressure of the order of 10^{-5} Torr to 10^{-15} Torr and while said diamond edge or points is subjected to said reduced temperature and pressure, irradiating said diamond edge or point with an electron microbeam to smooth out minute irregularities and obtain an atomic smoothness, annealing and glazing.

4,319,890

DRY IMPACT CAPTURE OF AEROSOL PARTICULATES

Aaron J. Teller, Westboro, and Denis R. J. Roy, Shrewsbury, both of Mass., assignors to Teller Environmental Systems, Inc., Shrewsbury, Mass.

Continuation of Ser. No. 892,881, Apr. 5, 1978, abandoned. This application Sep. 29, 1980, Ser. No. 192,084
Int. Cl.[3] B01D *51/04, 50/00;* B03C *3/00*
U.S. Cl. 55—1 5 Claims



1. In a method of treating a primary gas stream flowing in a conduit to facilitate the removal therefrom of submicron contaminating particulates, wherein a secondary gas stream with target particulates dispersed therein is introduced into the primary gas stream to promote inertial impaction between said contaminating and target particulates, the improvement comprising:

introducing said secondary gas stream countercurrently to said primary gas stream through an annular orifice circumscribing an area within said conduit; the average particle size of the target particulates being between about 3–50 microns; and

deflecting said primary gas stream radially outward with reference to the longitudinal axis of the conduit and away from said area and across said orifice into an annular flow path, the flow path of the primary stream being transverse to the countercurrent flow path of the secondary gas stream at said orifice, while simultaneously accelerating said primary gas stream to achieve a relative velocity between said primary and secondary gas streams at said orifice of about 20–200 feet per second such that the target particulates penetrate the entire primary stream, the primary and secondary streams forming a combined gas stream.

4,319,891

COMBINED SONIC AGGLOMERATOR/CROSS FLOW GAS FILTRATION SYSTEM AND METHOD

Gerald L. Anderson, Romeoville; Michael Onischak, Olympia Fields, and William F. Rush, Tinley Park, all of Ill., assignors to Gas Research Institute, Chicago, Ill.

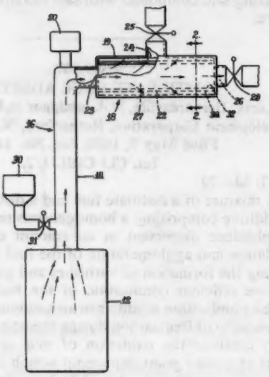
Filed Nov. 13, 1980, Ser. No. 206,341
Int. Cl.[3] B01D *51/04, 51/08, 46/24*
U.S. Cl. 55—15 18 Claims

1. Filtration apparatus for removing particles from gas streams comprising in combination;

a sonic agglomerator comprising a gas conduit and a sound source generating a sonic field within said gas conduit for agglomerating said particles into agglomerates as said gas stream passes through said conduit; and

a cross flow filter comprising a housing and a rigid porous filter element having an interior side and an exterior side positioned within said housing; said filter housing having an input port in communication with the exit of said sonic agglomerator gas conduit and said filter element interior side, a clean gas port in said filter housing in communication with said filter element exterior side, and an exit port in said filter housing in communication with said filter element interior side, said filter element having pore diameters of a size to retain said agglomerates adjacent said interior side of said filter element, whereby a portion of said gas stream passes through said clean gas port and a portion of said gas stream and said agglomerates pass through said exit port of said filter housing.

9. A process for removing small particles from gas streams comprising the steps of: agglomerating said small particles into larger agglomerates by passing said small particles through a sonic field provided by a sonic agglomerator having a gas conduit and then removing said agglomerates from said gas stream by passing said gas stream with said agglomerates through a cross flow filter comprising a housing and a rigid, porous filter element having an interior side and an exterior



side positioned within said housing, said filter housing having an input port in communication with the exit of said sonic agglomerator gas conduit and said filter element interior side, a clean gas port in said filter housing in communication with said filter element exterior side, and an exit port in said filter housing in communication with said filter element interior side, said filter element having pore diameters of a size to retain said agglomerates adjacent said interior side of said filter element, whereby a portion of said gas stream passes through said clean gas port and a portion of said gas stream and said agglomerates pass through said exit port of said filter housing.

4,319,892

MAGNETICALLY STABILIZED BED, TEMPERATURE, PARTIAL PRESSURE SWING, HYDROGEN RECOVERY PROCESS

Robert H. Waghorne; Martin O. Gernand, and Bernie J. Pafford, all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 2, 1980, Ser. No. 183,378
Int. Cl.[3] B01D *53/12*
U.S. Cl. 55—60 12 Claims

1. In an adsorption process for the recovery of hydrogen from a vapor or gas feed containing hydrogen in admixture with one or more component hydrocarbons, alone or in admixture with non-hydrocarbon components, wherein particulate adsorbent solids are circulated between an adsorption zone for contact with said feed at relatively low temperature to selectively adsorb hydrocarbons and thereby concentrate the hydrogen within the off gas from said adsorption zone for recovery, the particulate adsorbent solids which selectively adsorb hydrocarbon components are transported to a desorption zone operated at sufficient temperature above that of the adsorption zone to desorb hydrocarbon and regenerate the said particulate adsorbent solids, the regenerated particulate adsorbent solids are cooled and recycled to said adsorption zone

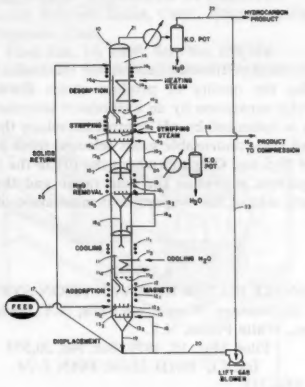
the improvement comprising

(a) contacting countercurrently said feed in said adsorption zone with a downwardly moving, fluidized bed of the

particulate adsorbent solids provided with a magnetic component, magnetically stabilizing said bed to suppress the gross circulation of adsorbent solids within said bed, while adsorbing hydrocarbons from said feed on said bed, withdrawing from said adsorption zone a hydrocarbon-denuded gas stream of higher hydrogen content than that contained in the feed entering said magnetically stabilized adsorption zone, withdrawing hydrocarbon enriched, hydrogen-containing particulate adsorbent solids from said magnetically stabilized adsorption zone and passing same to a hydrogen displacement zone, and then

(b) contacting countercurrently said hydrocarbon enriched, hydrogen containing particulate adsorbent solids in said hydrogen displacement zone by passing same in plug flow and contacting same with a hydrocarbon gas sufficient to substantially displace hydrogen, passing the displaced hydrogen into the adsorption zone, and removing the hydrogen denuded, hydrocarbon-containing particulate adsorbent solids from said hydrogen displacement zone and transporting same to the desorption zone.

3. In an adsorption process for the recovery of hydrogen from a vapor or gas feed containing hydrogen in admixture with one or more component hydrocarbons, alone or in admixture with non-hydrocarbon components, wherein particulate adsorbent solids are circulated between an adsorption zone for contact with said feed at relatively low temperature to selectively adsorb hydrocarbons and thereby concentrate the hydrogen within the off gas from said adsorption zone for recovery, the particulate adsorbent solids which selectively adsorb hydrocarbons are transported to a desorption zone operated at sufficient temperature above that of the adsorption zone to desorb hydrocarbon and regenerate the said particulate adsorbent solids, the regenerated particulate adsorbent solids are cooled and recycled to said adsorption zone



the improvement comprising

(a) contacting countercurrently said feed in said adsorption zone with a downwardly moving, fluidized bed of the particulate adsorbent solids provided with a magnetic component, magnetically stabilizing said bed to suppress the gross circulation of adsorbent solids within said bed, while adsorbing hydrocarbons from said feed on said bed, withdrawing from said adsorption zone a hydrocarbon-denuded gas stream of higher hydrogen content than that contained in the feed entering said magnetically stabilized adsorption zone, withdrawing hydrocarbon enriched, hydrogen-containing particulate adsorbent solids from said magnetically stabilized adsorption zone and passing same to a hydrogen displacement zone,

(b) contacting countercurrently said hydrocarbon-enriched, hydrogen-containing particulate adsorbent solids in said hydrogen displacement zone by passing same in plug flow and contacting same with a hydrocarbon gas sufficient to substantially displace hydrogen, passing the displaced hydrogen into the adsorption zone, and removing the hydrogen-denuded, hydrocarbon-containing particulate adsorbent solids from said hydrogen displacement zone and transporting same to the desorption zone.

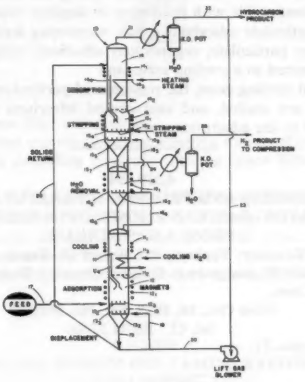
(c) heating in the desorption zone a fluidized bed of said hydrogen-denuded, hydrocarbon-containing particulate solids at temperature sufficient to desorb hydrocarbons from said particulate solids, removing hydrocarbons from said zone, and passing particulate adsorbent solids containing at least residual amounts of hydrocarbons to a hydrogen stripping zone, and

(d) in said hydrogen stripping zone, contacting counter-currently with hydrogen, the residual hydrocarbons-containing particulate adsorbent solids as a moving, fluidized bed, while magnetically stabilizing said bed to suppress the gross circulation of adsorbent solids within said bed, to desorb, and substantially displace the residual hydrocarbons with hydrogen.

4,319,893
MAGNETICALLY STABILIZED BED, TEMPERATURE, PARTIAL PRESSURE SWING, HYDROGEN RECOVERY PROCESS

Walter H. Hatch, Summit, N.J.; George J. Balinsky, Baton Rouge, La., and Steve Ackerman, Randolph, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 2, 1980, Ser. No. 183,379
Int. Cl.³ B01D *53/19*
U.S. Cl. 55—60 **11 Claims**



1. In an adsorption process for the recovery of hydrogen from a vapor or gas feed containing hydrogen in admixture with one or more component hydrocarbons, alone or in admixture with non-hydrogen components, wherein particulate adsorbent solids are circulated between an adsorption zone for contact with said feed at relatively low temperature to selectively adsorb hydrocarbons and thereby concentrate the hydrogen within the off gas from said adsorption zone for recovery, the particulate adsorbent solids which selectively adsorb hydrocarbon components are transported to a desorption zone operated at sufficient temperature above that of the adsorption zone to desorb hydrocarbon and regenerate the said particulate adsorbent solids, the regenerated particulate adsorbent solids are cooled and recycled to said adsorption zone

the improvement comprising

(a) contacting countercurrently said feed in said adsorption zone with a downwardly moving, fluidized bed of the particulate adsorbent solids provided with a magnetic component, magnetically stabilizing said bed to suppress the gross circulation of adsorbent solids within said bed, while adsorbing hydrocarbons from said feed on said bed, withdrawing from

said adsorption zone a hydrocarbon-denuded gas stream of higher hydrogen content than that contained in the feed entering said magnetically stabilized adsorption zone, withdrawing hydrocarbon enriched, hydrogen-containing particulate adsorbent solids from said magnetically stabilized adsorption zone and passing same to a hydrogen displacement zone,

(b) contacting countercurrently said hydrocarbon enriched, hydrogen containing particulate adsorbent solids in said hydrogen displacement zone by passing same in plug flow and contacting same with a hydrocarbon gas sufficient to substantially displace hydrogen, passing the displaced hydrogen into the adsorption zone, and removing the hydrogen-denuded, hydrocarbon-containing particulate adsorbent solids from said hydrogen displacement zone and transporting same to the desorption zone,

(c) heating in said desorption zone, a fluidized bed of said hydrogen-denuded, hydrocarbon-containing particulate solids at temperature sufficient to desorb hydrocarbons from said particulate solids, removing hydrocarbons from said zone, and passing particulate adsorbent solids containing at least residual amounts of hydrocarbons to a steam stripping zone,

(d) in said steam stripping zone, countercurrently contacting with steam the residual hydrocarbons-containing particulate adsorbent solids as a moving bed to desorb and substantially displace the residual hydrocarbons with steam, and then transporting the steam-containing particulate adsorbent solids to a water removal zone, and

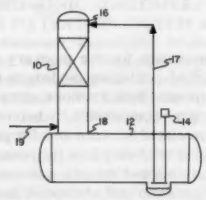
(e) in said water removal zone, contacting the wet particulate adsorbent solids with hydrogen to displace water and dry the particulate adsorbent solids, recovering hydrogen, and the dry particulate, regenerated adsorbent solids are then transported to a cooling zone, and

(f) in said cooling zone, the regenerated particulate adsorbent solids are cooled, and said cooled adsorbent solids then passed to the adsorption zone.

4,319,894
PROCESS AND PROCESS APPARATUS FOR SEPARATING GASEOUS PHOSPHORUS TRICHLORIDE FROM A GAS STREAM

Alan L. Kempner, Yonkers, and Robert H. Kaplan, New City, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 16, 1978, Ser. No. 951,689
Int. Cl.³ B01D *57/00*
U.S. Cl. 55—71 **6 Claims**



1. In a process for preventing or reducing the discharge of aqueous phosphorus trichloride to the atmosphere due to the accidental discharge of a high volume gas stream from a phosphorus trichloride reaction vessel, the gas stream containing at least about 20% (by volume) of gaseous phosphorus trichloride, the improvement comprising:

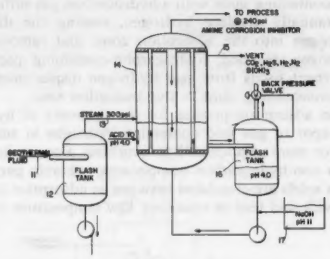
(a) contacting the gas stream with a condensing amount of liquid phosphorus trichloride to condense a portion of the gaseous phosphorus trichloride to liquid phosphorus trichloride; and

(b) separating the liquid phosphorus trichloride from the gas stream; wherein the weight ratio of the condensing amount of liquid phosphorus trichloride to gaseous phosphorus trichloride is at least about 10:1.

4,319,895
OPTIMIZING THE QUALITY OF STEAM FROM GEOTHERMAL FLUIDS

Frank N. Kemmer, La Grange, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 10,196, Feb. 8, 1979, abandoned. This application May 19, 1980, Ser. No. 150,921
Int. Cl.³ B01D *14/00*
U.S. Cl. 55—73 **3 Claims**

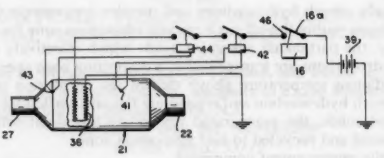


1. A method of treating geothermal fluid which comprises optimizing the quality of product steam discharged after steam-water separation by an evaporator wherein the quality of steam is optimized by pH control to reduce the content of associated non-condensable gases selected from a group consisting of H_2S and CO_2 and where the pH in the input side of the evaporator is kept in the acid range and the pH in the condensate side of the evaporator is maintained in an alkaline range.

4,319,896
SMOKE FILTER REJUVENATION SYSTEM

William M. Sweeney, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 15, 1979, Ser. No. 20,573
Int. Cl.³ B01D *53/04;* F01N *3/14*
U.S. Cl. 55—213 **5 Claims**



1. In situ regeneration system for a smoke filter for an internal combustion engine, the latter including a fuel control linkage which is actuatable by an operator to regulate the flow of fuel whereby to adjust the fuel-to-air mixture which is burned in the engine combustion chambers, and an exhaust conduit for conducting a stream of hot exhaust gas and carbon particles from the engine to the smoke filter, said filter including:

a reactor compartment (28) having a particle retaining bed (29) disposed therein,

inlet and exhaust ports communicated with said reactor compartment (28) to facilitate the flow of exhaust gas from said conduit (19) through said bed (29),

an electric heater element 36 disposed within said filter reactor compartment (28),

temperature sensor means 41 in said reactor compartment

(23), being operable to sense the temperature therein and to close a temperature sensor switch 42 in response to the temperature in said compartment (23) exceeding a predetermined level,

pressure sensor means (43) within said filter, being operable to sense the pressure within the filter and to close a pressure sensing switch (44) in response to the pressure in said filter exceeding a predetermined level,

a first switch (46) operably connected to said fuel control linkage whereby to be adjusted to the closed position when said fuel control linkage is operated to a position whereby to cause an air rich fuel/air mixture to be introduced to and burned in the engine combustion chamber,

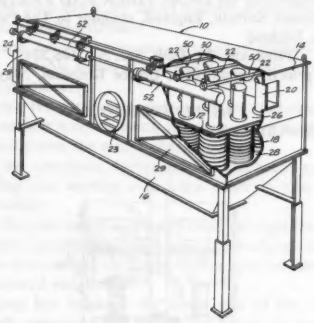
a heater circuit including said heater element (36), a source of electrical energy (39) connected to said heater element (36) to periodically actuate the same, said pressure and temperature switches (42) and (44) being connected in series with the source of electrical energy (39) and with said first switch (46) respectively whereby to allow an operator to actuate the heater element (36) in response to a predetermined condition within the filter, when an air rich fuel/air mixture is being burned in the engine.

4,319,897

AIR FILTER ASSEMBLY INCLUDING AN IMPROVED JET PUMP CLEANING APPARATUS

Paul A. Labadie, Redondo Beach, Calif., assignor to Farr Company, El Segundo, Calif.

Filed Jun. 16, 1980, Ser. No. 159,761
Int. Cl.³ B01D *46/04*; F04F *5/46*
U.S. Cl. 55—302 **8 Claims**



1. A jet pump for use in a filter assembly for back pulsing a filter element to remove accumulated dust therefrom, said pump comprising a nozzle, means for communicating said nozzle with a source of pressurized fluid, and a hollow tube having a constant radius portion, the length of said constant radius portion being three to four times the diameter thereof, a first bell-mouth opening at one end thereof and a second bell-mouth opening at the other end thereof, the radius defining said first bell-mouth opening being about 0.3 times the diameter of said constant radius portion of said tube.

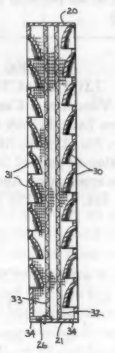
5. In an air filter assembly having an upper clean air outlet chamber separated from a lower dirty air chamber by a partition having a plurality of apertures therein, a corresponding plurality of filter elements mounted in said lower dirty air chamber about said apertures and a corresponding plurality of pressurized air nozzles for directing back pulses of air through said filter elements for removing the dust therefrom, an improvement comprising: an ejector tube mounted over each of said apertures and below each of said air nozzles for directing air flow from the lower air chamber to the upper air chamber and for directing pulses of air from each of said nozzles through each of said filter elements and entraining air disposed about the upper end of said tube into said filter element, said tube having a constant radius portion extending substantially the length thereof, the length of said constant radius portion being three to four times the diameter thereof, a bell-mouth opening at the upper end of said constant radius portion and a bell-mouth opening at the lower end of said constant radius portion, the radius of said bell-mouth opening at the upper end of said tube being about 0.3 times the diameter of said constant radius portion of said tube.

4,319,898

LOUVER GREASE FILTER

Max Maierhofer, Germantown, Wis., assignor to Air Filter Corporation, Milwaukee, Wis.

Filed Mar. 20, 1981, Ser. No. 246,031
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—322 **7 Claims**



1. A grease filter comprising:

spaced front and rear walls each having a series of transverse louvers extending inwardly into the space between the walls,

the series of louvers in the rear wall being offset from the series of louvers in the front wall along the axis of air movement through said filter so that air must travel an indirect path through said filter; and

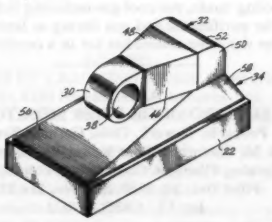
filter media disposed in the space between said front and rear walls.

4,319,899

AIR HANDLING SYSTEM FOR LAMINAR FLOW CLEAN ENCLOSURE

R. Claude Marsh, Albuquerque, N. Mex., assignor to Pure Air Corporation, Canoga Park, Calif.

Filed Apr. 28, 1980, Ser. No. 144,693
Int. Cl.³ B01D *46/00*
U.S. Cl. 55—416 **16 Claims**



1. A gas handling system comprising:

a planar filter having a large cross-sectional area, a pair of ends and a pair of sides longer than the ends;

a blower having an outlet with a substantially smaller cross-sectional area than the filter, the outlet of the blower being oriented to direct gas parallel to the plane of the filter;

a plenum chamber in communication with the filter; and

means for coupling the outlet of the blower to the plenum chamber,

characterized in that the coupling means comprises a diverging section designed to expand gas flowing therethrough in a plane parallel to the plane of the filter and an elbow section joining the diverging section to the plenum chamber near one end of the filter in spaced relationship therefrom, the elbow section having ends and sides both smaller than those of the filter, thereby introducing gas from the blower into the plenum chamber with a substantial velocity component parallel to the plane of the filter and the plenum chamber is so shaped as to deliver gas from the blower to all parts of the filter at approximately uniform velocity.

4,319,900

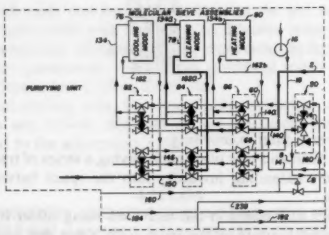
LIQUEFACTOR

Anker Gram, North Vancouver, Canada, assignor to Cleanair Combustion Systems Ltd., British Columbia, Canada

Continuation of Ser. No. 22,665, Mar. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 838,195, Sep. 30, 1977, abandoned. This application Apr. 7, 1980, Ser. No. 137,679

Int. Cl.³ F25J *3/00*

U.S. Cl. 62—42 **29 Claims**



1. An apparatus for purifying and liquifying an input gas containing natural gas and air, the apparatus comprising:

a plurality of molecular sieve assemblies operable to clean the gas on a gas cleaning mode and to be regenerated on a heating mode and a cooling mode, a first sieve assembly cleaning the gas while a second sieve assembly is being regenerated;

means for cyclically changing the modes of the sieve assemblies;

means for liquifying the natural gas purified by said sieve assemblies and for separating air therefrom;

means for supplying heated air for heating the sieve assemblies during the heating mode; and

means for directing cool gas to the sieve assemblies during the cooling mode, the cool gas including the air separated from the purified natural gas during at least a portion of the time the sieve assemblies are in a cooling mode.

4,319,901

ELECTRO-OPTIC FIBER MONITOR

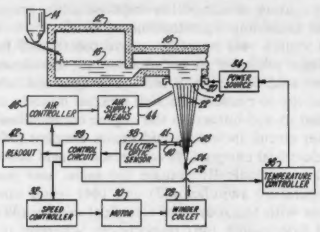
Michael T. Pellegrin, Newark, Ohio; Gerhard Kreikebaum, and Frederick M. Shofner, both of Knoxville, Tenn., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 10, 1980, Ser. No. 214,822

Int. Cl.³ C03B *37/025*

U.S. Cl. 65—2 **5 Claims**

1. A method of monitoring the average diameter of a plurality of glass fibers, said method comprising the steps of: generating electromagnetic radiation; using a first lens to form said electromagnetic radiation into a beam; directing said beam through a sampling volume for impingement upon said fibers; positioning a second lens in the same horizontal plane as said first lens such that the arc tangent $D/d \geqq 5°$, where D is the diameter of said second lens and d is the distance from a plane



through the center of said second lens to the center of the sampling volume; collecting electromagnetic radiation backscattered from said fibers by means of said second lens; and generating a signal responsive to the amount of radiation collected as an indication of the average diameter of said fibers.

4,319,902

JOINING OPTICAL FIBER END PARTS

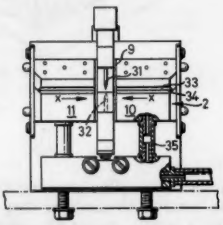
Paul C. Hensel, Suffolk, England, assignor to The Post Office, London, England

Filed Apr. 30, 1980, Ser. No. 145,384

Claims priority, application United Kingdom, May 1, 1979, 15133/79

Int. Cl.³ C03B *23/20*

U.S. Cl. 65—4.21 **8 Claims**



1. A method of welding two optical fibres in aligned end-to-end relationship, comprising the steps of:

positioning the fibre end parts into abutting relationship;

initiating an electrical current to strike a welding arc to heat both fibre end parts to a melting temperature; and

transducing said electrical current into movement of the fibre ends into one another for a predetermined distance.

2. Welding apparatus for joining optical fibers in aligned end-to-end relationship, comprising:

support elements for supporting the fiber end parts in axially aligned relationship;

electrically powered heating means for heating the fiber end parts to a welding temperature; and

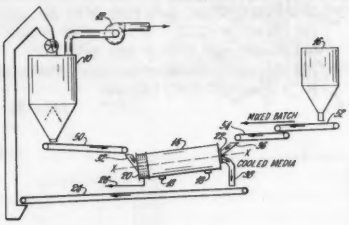
a piezo-electric transducer connected to the power supply for said heating means and responsive to the initiation of the supply of electrical current to said heating means for moving at least one of said support elements and the heated fiber and part supported thereby towards the other heated fiber end part.

4,319,903

METHOD AND APPARATUS FOR PREHEATING GLASS BATCH

Charles M. Hohman, Granville; Mark A. Propster, Gahanna, and Stephen Seng, Bladensburg, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 27, 1980, Ser. No. 181,589
Int. Cl.[3] C03B 1/00; F28D 19/02
U.S. Cl. 65—27 19 Claims



1. A process for producing glass by charging to a melting furnace and melting therein a particulate glass batch, including the steps of:

heating durable heat transfer media, larger in particle size than the glass batch, by direct contact with exhaust gases from the melting furnace;

introducing the hot media into one end of an inclined container rotatable about an axis having the same inclination as the container;

introducing the particulate glass batch into the other end of the container with the batch charging end of the container elevated above the media charging end;

rotating the container, during rotation the batch and media tumbling and moving over each other in heat transfer relationship;

moving the glass batch in one direction through the rotating container towards the lower end for discharge and moving the hot media in the opposite direction for discharge at the elevated end; and

discharging hot batch at the lower end of the container through openings that allow the batch to pass freely through but that prevent the media from passing.

7. An apparatus for preheating particulate glass batch comprising:

means for heating durable heat transfer media by direct contact with exhaust gases from a melting furnace;

a container rotatable about an axis, the axis being inclined to the horizontal;

means for introducing the hot media, larger in particle size than the glass batch, into the lower end of the container for movement towards the elevated end for discharge;

means for introducing particulate glass batch into the elevated end of the container for movement towards the lower end for discharge;

means for rotating the container along the inclined axis;

means associated with the interior of the container for tumbling and moving the particulate glass batch in direct contact with hot media during rotation of the container to heat the glass batch prior to charging to a melting furnace; and

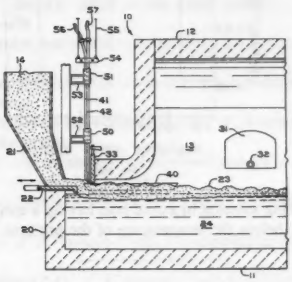
means for discharging hot batch at the lower end of the container having openings of a size that allows the batch to pass freely through the openings but that prevents the media from passing through the openings.

4,319,904

METHOD AND APPARATUS FOR GUIDING GLASS BATCH IN A GLASS MELTING FURNACE

Elmer G. Gullett, Cochranton, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 8, 1980, Ser. No. 185,057
Int. Cl.[3] C03B 3/00
U.S. Cl. 65—27 18 Claims



1. In a continuous process for melting glass, wherein raw glass batch materials are fed through an inlet opening at one end of an elongated melting furnace and form a floating layer on the surface of a pool of molten glass contained within the furnace, and the batch layer progresses in a generally longitudinal direction from said one end toward a center portion of the furnace until the batch materials become liquified by heat within the furnace, the improvement comprising engaging an extended upper surface portion of the batch layer with a horizontal bottom surface portion of an elongated rudder member having a substantial linear extent horizontally from a location closely adjacent to the inlet opening in generally the longitudinal direction, and maintaining the bottom surface portion of the rudder member embedded within the upper portion of the batch material to a depth which avoids dividing the batch layer but sufficient to restrain the batch layer against lateral drifting.

9. In a continuous glass melting furnace provided with an inlet at one end, and feeding means at the inlet for feeding a layer of glass batch materials onto a pool of molten glass contained within the furnace and for moving the batch layer in a longitudinal direction into the furnace, the improvement comprising an elongated rudder member extending horizontally from a location closely adjacent to the inlet in generally the longitudinal direction and having a horizontal bottom surface of substantial linear extent, the bottom surface portion being supported at an elevation so as to be embedded within the upper portion of the batch layer to a depth sufficient to restrain the batch layer against lateral drifting but avoiding dividing the batch layer.

4,319,905

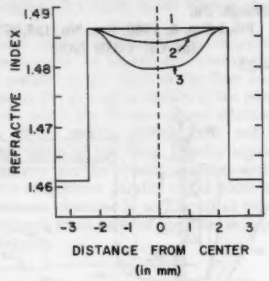
METHOD OF LEACHING GLASS PREFORMS

Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20034, and Theodore A. Litovitz, 904 Devere Dr., Silver Spring, Md. 20903

Division of Ser. No. 917,100, Jun. 9, 1978, Pat. No. 4,236,930, which is a division of Ser. No. 635,728, Nov. 26, 1975, Pat. No. 4,110,093, which is a continuation-in-part of Ser. No. 559,512, Mar. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 462,481, Apr. 22, 1974, Pat. No. 3,938,974. This application Jun. 25, 1980, Ser. No. 162,893
Int. Cl.[3] C03C 23/00
U.S. Cl. 65—31 7 Claims

1. A method of leaching a glass preform made of alkali

borosilicate glass, comprising reducing the concentration of boric acid in a leaching solution by precipitating boric acid out



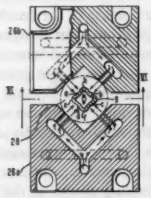
of the leaching solution in a cold trap having a temperature at least 20° C. below the temperature of the preform.

4,319,906

METHOD AND APPARATUS FOR PRESS SEALING AN ARC TUBE BODY SECTION

Paul Fix, Bath, and Kent L. Collins, Hammondsport, both of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 24, 1980, Ser. No. 219,693
Int. Cl.³ C03C *27/02*
U.S. Cl. 65—59.26 **2 Claims**



1. The method of press sealing a tubular quartz arc tube body section about a ribbon-type metallic seal means, which method comprises:

inserting into said arc tube body section to be pressed, said ribbon-type metallic seal means which is to be press sealed;

applying different intensities of heat to said arc tube body section to be pressed in such a manner that four portions of said arc tube body section which are located within diametrically opposed quadrant sections are heated to a higher softened-state temperature than those portions of said heated arc tube body section which are positioned intermediate the higher-heated quartz body portions, with the higher-heated quartz body portions collapsing somewhat due to the surface tension of the softened quartz; and

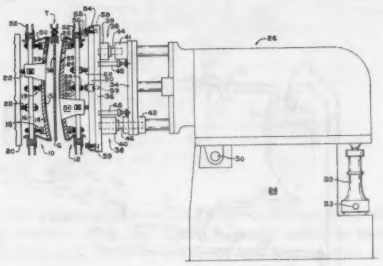
applying to said softened quartz arc tube body section a deformation pressure by moving two pressing jaws of predetermined configuration onto two opposite sides of said softened quartz body section with a motion to the jaws toward one another first contacting oppositely disposed lesser-heated quartz body portions so that during the pressing action, the jaw-contacted lesser-heated quartz body portions are driven into the higher-heated quartz body portions, and continuing the pressing action to drive the softened quartz onto the remaining lesser-heated quartz body portions which are positioned in a line which is normal to the direction of the pressing jaws.

4,319,907

METHOD FOR BENDING AND TEMPERING AN APERTURED GLASS SHEET

Robert F. Pike, Altoona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 15, 1980, Ser. No. 186,988
Int. Cl.³ C03B *23/03*
U.S. Cl. 65—106 **4 Claims**



1. In a method of bending and tempering a glass sheet having at least one aperture wherein the method includes the steps of heating the glass sheet to a temperature sufficient for subsequent bending and tempering; positioning the heated sheet on shaping surface of shaping means; bending the sheet by way of the shaping means; and cooling the bent sheet to impart at least a partial temper thereto, the improvement comprising the steps of:

providing the shaping surface of the shaping means with an aperture consisting of a hole; and

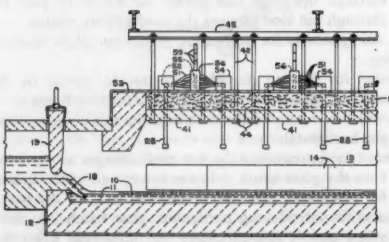
the positioning step includes the step of aligning the at least one aperture in the sheet and the aperture in the shaping surface.

4,319,908

FLOAT GLASS FORMING CHAMBER WITH A FLAT SLAB ROOF

John E. Sensi, Arnold, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 26, 1980, Ser. No. 210,658
Int. Cl.³ C03B *18/16*
U.S. Cl. 65—182.5 **16 Claims**



1. An apparatus for producing flat glass by the float process comprising an elongated enclosure adapted to hold a pool of molten metal, means for delivering a stream of molten glass into the enclosure onto the molten metal, and means for drawing the glass along the length of the enclosure and for withdrawing the glass from the enclosure as a formed ribbon, the improvment comprising: a substantial portion of the roof of the enclosure being constructed of a plurality of substantially horizontally extending refractory slabs abutting one another, each slab having a substantially planar bottom surface facing

the interior of the enclosure, and means for supporting the slabs.

4,319,909

GLASS MELT TANKS

Arne S. B. Fransson, Diamantstigen 8, Emmaboda S-361 00, Sweden

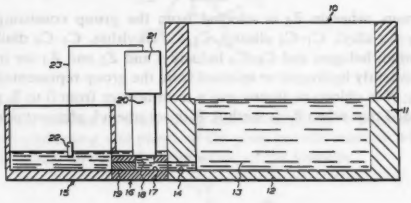
PCT No. PCT/SE78/00027, § 371 Date Apr. 10, 1979, § 102(e) Date Apr. 10, 1979, PCT Pub. No. WO79/00090, PCT Pub. Date Mar. 8, 1979

PCT Filed Aug. 8, 1978, Ser. No. 29,342

Claims priority, application Sweden, Aug. 10, 1977, 7709047

Int. Cl.[3] C03B *5/26*

U.S. Cl. 65—331 4 Claims



1. In a glass melt tank of the type provided with a feeder, the improvement comprising

a channel connecting said feeder with a lower portion of said tank, through which molten glass can be supplied from said tank to said feeder,

said channel having a horizontal branch connected to said tank and a vertical branch, said vertical branch having an upper end constituting a seat,

a regulator in said channel engageable with said seat for opening and closing said channel to regulate the level of molten glass in said feeder, said regulator being a continuously rotatable, raisable and lowerable cylindrical member and a drive therefor, and a level sensing means in said feeder connected to said drive for the cylindrical member.

4,319,910

GELATED MICRONUTRIENT FERTILIZERS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE FOR PLANT FERTILIZATION

Klaus Meyer, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 25, 1979, Ser. No. 87,943

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846832

Int. Cl.[3] C05C *1/02, 3/00*

U.S. Cl. 71—27 7 Claims

1. A water soluble gelated micronutrient fertilizer consisting essentially of 55 to 89% by weight of a water soluble micronutrient compound of which 25 to 100 mol percent, calculated on the micronutrient cations, said micronutrient fertilizer is selected from the group consisting of Mg, Fe, Zn, Mn, Cu, Co, Ni, B and Mo, is in complexed form, 2 to 7% by weight of a macronutrient of ammonium nitrogen, 2 to 18% by weight of either, or both, of a polyglycol ether having at least 9 ethylene oxide units per molecule or a water soluble polyglycol ether derivative having at least 8 ethylene oxide units per molecule and 7 and 20% by weight of water.

4,319,911

TRIAZOLYL DERIVATIVES, THEIR MANUFACTURE, AND AGENTS CONTAINING THEM FOR INFLUENCING PLANT GROWTH

Eberhard Ammermann, Ludwigshafen; Costin Rentzea, Heidelberg, and Johann Jung, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 24, 1980, Ser. No. 143,475

Int. Cl.[3] A01N *43/64;* C07D *249/08*

U.S. Cl. 71—76 3 Claims

1. A triazolyl derivative selected from the group consisting of:

4-chlorophenyl-[3′-(1″,2″,4″-triazol-1″-yl)-4′,4′-dimethylpent-2′-yl]-ketone;

1-(4′-chlorophenyl)-2,4,4-trimethyl-3-[(1″,2″,4″-triazol-1″-yl)-pent-1-yl]-alcohol;

methyl-1-(4″-chlorophenyl)-2,4,4-trimethyl-3-[(1″, 2″,4″-triazol-1″-yl)-pent-1-yl]-ether;

1,3-diphenyl-2-methyl-3-[(1″,2″,4″-triazol-1″-yl)-prop-1-yl]-alcohol;

phenyl-[3′(1″,2″,4″-triazol-1″-yl)-3′-α-naphthylprop-2′-yl]-ketone;

4-fluorophenyl-[3′-(1″,2″,4″-triazol-1″-yl)-4′,4′-dimethylpent-2′-yl]-ketone;

phenyl-[3′-(1″,2″,4″-triazol-1″-yl)-4′-methylpent-2′-yl]-ketone;

4-chlorophenyl-[3′-(1″,2″,4″-triazol-1″-yl)-4′-methylpent-2′-yl]-ketone;

the acid addition salts thereof; or a complex formed by reacting the triazolyl derivative with a salt of cobalt, iron, nickel, copper, zinc or manganese.

2. A process for reducing the stem length in growing plants, wherein the plants, seed or the soil are treated with a triazolyl derivative selected from the group consisting of:

4-chlorophenyl-[3′-(1″,2″,4″-triazol-1″-yl)-4′,4′-dimethylpent-2′-yl]-ketone;

1-(4′-chlorophenyl)-2,4,4-trimethyl-3-[(1″,2″,4″-triazol-1″-yl)-pent-1-yl]-alcohol;

methyl-1-(4′chlorophenyl)-2,4,4-trimethyl-3-[(1″,2″,4″-triazol-1″-yl)-pent-1-yl]-ether;

1,3-diphenyl-2-methyl-3-[(1″,2″,4″-triazol-1″-yl)-prop-1-yl]-alcohol;

phenyl-[3′-(1″,2″,4″-triazol-1″-yl)-3′-α-naphthylprop-2′-yl]-ketone;

4-fluorophenyl-[3′-(1″,2″,4″-triazol-1″-yl)-4′,4′-dimethylpent-2′-yl]-ketone;

phenyl-[3′-(1″,2″,4″-triazol-1″-yl)-4′-methylpent-2′-yl]-ketone;

4-chlorophenyl-[3′-(1″,2″,4″-triazol-1″-yl)-4′-methylpent-2′-yl]-ketone;

the acid addition salts thereof; or a complex formed by reacting the triazolyl derivative with a salt of cobalt, iron, nickel, copper, zinc or manganese.

4,319,912

PHOSPHONATE HERBICIDAL ANTIDOTES

Wayne R. Hillebrecht, Pleasanton, Calif., and Felice J. Calderoni, Monroe, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

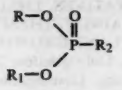
Filed Apr. 21, 1980, Ser. No. 141,868

Int. Cl.[3] A01N *57/02, 57/20*

U.S. Cl. 71—86 12 Claims

1. A method of controlling undesirable vegetation while reducing herbicidal injury to crops due to a thiocarbamate herbicide which comprises adding to the soil in which a herbicidally effective amount of said thiocarbamate herbicide is used,

(a) a non-phytotoxic antidotally effective amount of a phosphonate of the formula:

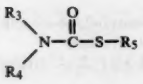


in which

R and R_1 are independently selected from the group consisting of alkyl having 1–4 carbon atoms and haloalkyl having 1–4 carbon atoms; and

R_2 is selected from the group consisting of hydrogen and halohydroxyalkyl having 1–4 carbon atoms; and

(b) a herbicidally effective amount of a thiocarbamate of the formula:



in which

R_3 is selected from the group consisting of alkyl having 1–6 carbon atoms and alkenyl having 2–6 carbon atoms;

R_4 is selected from the group consisting of alkyl having 1–6 carbon atoms, alkenyl having 2–6 carbon atoms, cyclohexyl and phenyl; or

R_3 and R_4 together form an alkylene group having 5–10 carbon atoms; and

R_5 is selected from the group consisting of alkyl having 1–6 carbon atoms, haloalkyl having 1–6 carbon atoms, cycloalkyl having 5–10 carbon atoms, phenyl, substituted phenyl, wherein the substituents are alkyl having 1–4 carbon atoms, haloalkyl having 1–4 carbon atoms, and halo, benzyl and substituted benzyl, wherein the substituents are alkyl having 1–4 carbon atoms, haloalkyl having 1–4 carbon atoms and halo.

4,319,913

SUBSTITUTED BENZAZAPHOSPHOLES, HERBICIDAL COMPOSITIONS AND THE USE THEREOF

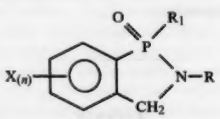
Raymond C. Grabiak, Creve Coeur, and James A. Miles, Olivette, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 55,431, Jul. 6, 1979, abandoned. This application Feb. 25, 1980, Ser. No. 119,051

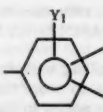
Int. Cl.[3] **A01N** *57/36;* **C07F** *9/65*

U.S. Cl. 71—86 **22 Claims**

1. A compound of the formula

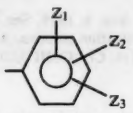


wherein R is selected from the group consisting of hydrogen, C_1–C_8 alkyl, benzyl, trimethylsilyl, phenyl, phenoxyphenyl, a

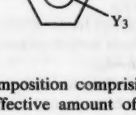


group, wherein Y_1 is selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkyl, nitro and halogen and Y_2 and Y_3 are independently either hydrogen or selected from the group represented by Y_1, and substituted carbonyl of the formula

wherein R_2 is selected from the group consisting of C_1–C_4 alkoxy, C_1–C_4 haloalkyl and C_1–C_4 alkylamino; R_1 is selected from the group consisting of C_1–C_8 alkyl, C_3–C_8 cycloalkyl, phenyl, biphenyl, phenoxyphenyl and a

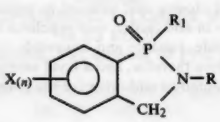


group, wherein Z_1 is selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 dialkylamino, halogen and C_1–C_4 haloalkyl and Z_2 and Z_3 are independently hydrogen or selected from the group represented by Z_1; X is chloro or fluoro and n is an integer from 0 to 2; provided that when R_1 is methyl, R is not phenyl, phenoxyphenyl or a

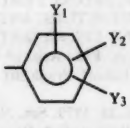


group.

7. A herbicidal composition comprising an inert adjuvant and a herbicidally effective amount of a compound of the formula

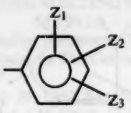


wherein R is selected from the group consisting of hydrogen, C_1–C_8 alkyl, benzyl, trimethylsilyl, phenyl, phenoxyphenyl, a

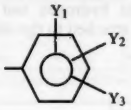


group, wherein Y_1 is selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkyl, nitro and halogen and Y_2 and Y_3 are independently either hydrogen or selected from the group represented by Y_1, and substituted carbonyl of the formula

wherein R_2 is selected from the group consisting of C_1–C_4 alkoxy, C_1–C_4 haloalkyl and C_1–C_4 alkylamino; R_1 is selected from the group consisting of C_1–C_8 alkyl, C_3–C_8 cycloalkyl, phenyl, biphenyl, phenoxyphenyl and a

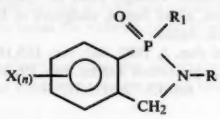


group, wherein Z_1 is selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 dialkylamino, halogen and C_1–C_4 haloalkyl and Z_2 and Z_3 are independently hydrogen or selected from the group represented by Z_1; X is chloro or fluoro and n is an integer from 0 to 2; provided that when R_1 is methyl, R is not phenyl, phenoxyphenyl or a

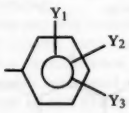


group.

13. A method of controlling undesired plants which comprises contacting said plants or the plant growth medium with a herbicidal amount of a compound of the formula

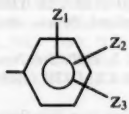


wherein R is selected from the group consisting of hydrogen, C_1–C_8 alkyl, benzyl, trimethylsilyl, phenyl, phenoxyphenyl, a

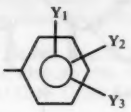


group, wherein Y_1 is selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkyl, nitro and halogen and Y_2 and Y_3 are independently either hydrogen or selected from the group represented by Y_1, and substituted carbonyl of the formula

wherein R_2 is selected from the group consisting of C_1–C_4 alkoxy, C_1–C_4 haloalkyl and C_1–C_4 alkylamino; R_1 is selected from the group consisting of C_1–C_8 alkyl, C_3–C_8 cycloalkyl, phenyl, biphenyl, phenoxyphenyl and a



group, wherein Z_1 is selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 dialkylamino, halogen and C_1–C_4 haloalkyl and Z_2 and Z_3 are independently hydrogen or selected from the group represented by Z_1; X is chloro or fluoro and n is an integer from 0 to 2; provided that when R_1 is methyl, R is not phenyl, phenoxyphenyl or a



group.

4,319,914

HERBICIDAL TETRAHYDROBENZOTHIAZOLYLIMIDAZOLIDINONES

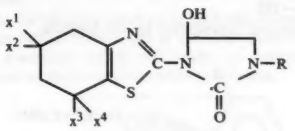
Leonard J. Stach, Riverside, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 16,854, Mar. 2, 1979, abandoned. This application Mar. 10, 1980, Ser. No. 129,064

Int. Cl.[3] **A01N** *43/54;* **C07D** *277/60*

U.S. Cl. 71—90 **5 Claims**

1. A compound of the formula



wherein each x^1, x^2, x^3 and x^4 is selected from the group consisting of alkyl, halogen and cyano; and R is selected from the group consisting of alkyl, alkenyl and haloalkyl.

4,319,915

HERBICIDAL COMPOSITIONS

Tetsuo Takematsu, Utsunomiya, and Hideshi Tsuchiya, Tokyo, both of Japan, assignors to Mitsubishi Gas Chemical Co., Inc. and Japan Hydrazine, both of Tokyo, Japan

Filed May 12, 1980, Ser. No. 150,223

Claims priority, application Japan, May 16, 1979, 54-59886

Int. Cl.[3] **A01N** *43/54, 43/58*

U.S. Cl. 71—92 **1 Claim**

1. A herbicidal composition which comprises as its active ingredients at least one uracil compound selected from the group consisting of 5-bromo-3-sec-butyl-6-methyluracil, 3-cyclohexyl-5,6-trimethyleneuracil, 5-bromo-3-isopropyl-6-methyluracil and 5-chloro-3-tert-butyl-6-methyluracil, and maleic acid hydrazide or its salt wherein the uracil type compound is in amount of 1 to 4% by weight and the maleic acid hydrazide or its salt is in amount of 10 to 20% by weight, all percentages being based on the weight of said composition.

4,319,916

3-ACYL-5-PHENYL-4(1H)-PYRIDINONES AND THEIR USE AS HERBICIDES

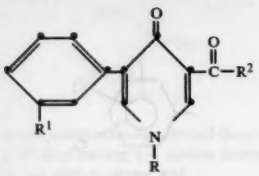
Riaz F. Abdulla, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 21, 1980, Ser. No. 179,598

Int. Cl.[3] **A01N** *43/40;* **C07D** *213/26*

U.S. Cl. 71—94 **28 Claims**

1. A compound of the formula



wherein R is C_1–C_3 alkyl; R^1 is chloro, bromo, fluoro or trifluoromethyl; R^2 is C_1–C_4 alkyl, phenyl, C_1–C_2 alkyl substituted with chloro or bromo or monosubstituted with methoxy, or phenyl monosubstituted with chloro, bromo, fluoro or trifluoromethyl.

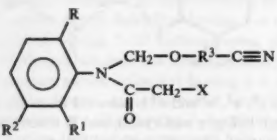
4,319,917

N-(2-CYANOALKOXY)METHYL-N-(2-,3-, OR 6-ALKYLPHENYL)-α-HALOACETAMIDES

William S. Grove, deceased, late of Doylestown, Ohio (by Louise A. Grove, administratrix), assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 12, 1981, Ser. No. 243,005
Int. Cl.³ A01N *37/34*; C07C *121/78*
U.S. Cl. 71—105 **7 Claims**

1. A compound represented by the formula:



wherein:

R is alkyl containing 1 to 4 carbon atoms;

R^1 is hydrogen or alkyl containing 1 to 4 carbon atoms;

R^2 is hydrogen or alkyl containing 1 to 4 carbon atoms;

R^3 is alkylene containing 1 to 3 carbon atoms which may be monosubstituted by alkyl containing 1 to 3 carbon atoms; and

X is halogen.

7. In a method of controlling weeds wherein a herbicidally effective amount of herbicide is applied to the growth medium prior to emergence of weeds therefrom wherein the improvement resides in using as the herbicide a herbicidally effective amount of a compound or mixture of compounds defined in claim 1.

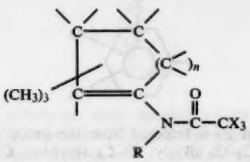
4,319,918

α-SUBSTITUTED N-(TRIMETHYLCYCLOALKENYL)-N-ALKYLACETAMIDES AND THEIR USE IN PHYTOTOXIC PREPARATIONS

Helmut Baltruschat; Hans Bellut, both of Dülmen, and Horst Schnurbusch, Herne, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl and Ruhr-Stickstoff Aktiengesellschaft, Bochum, both of, Fed. Rep. of Germany

Filed Dec. 28, 1979, Ser. No. 108,226
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1978, 2856651; Oct. 4, 1979, 2940231
Int. Cl.³ A01N *37/18*; C07C *103/37, 103/727*
U.S. Cl. 71—118 **18 Claims**

1. α-Substituted N-(trimethylcycloalkenyl)-N-alkylacetamides of the formula



wherein R represents a linear or branched alkyl or alkoxyalkyl radical having 1–6 carbon atoms or an allyl radical optionally suststituted with C_1–C_4 alkylene groups, and X is a substituent from the group consisting of hydrogen, methyl, chlorine, and bromine in any combination, n is an integer equal to 1 or 2, the free valences represent hydrogen and two of the methyl groups on the ring are attached to the same ring carbon atom.

4,319,919

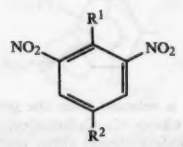
HERBICIDAL COMPOSITION

Shoin Nagato; Nobuo Takagi, both of Tokyo, and Heitaro Obara, Shiogama, all of Japan, assignors to Kaken Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1980, Ser. No. 155,188
Claims priority, application Japan, Jun. 19, 1979, 54/76321
Int. Cl.³ A01N *31/14*
U.S. Cl. 71—124 **7 Claims**

1. A method of controlling the growth of weeds, comprising:

applying to said weeds a herbicidally effective amount of a composition comprising, as the active ingredient, a compound of the formula:



wherein R^1 is C_1–C_5 alkoxy, and R^2 is hydrogen or C_1–C_5 alkyl in combination with a herbicidal adjuvant.

4,319,920

NOVEL ELECTROCONDUCTIVE COMPOSITIONS AND POWDER FOR USE THEREIN

John E. Ehrreich, Wayland, Mass., assignor to Ercon, Inc., Waltham, Mass.

Filed Mar. 3, 1980, Ser. No. 126,681
Int. Cl.³ C22B *11/04*
U.S. Cl. 75—0.5 A **11 Claims**

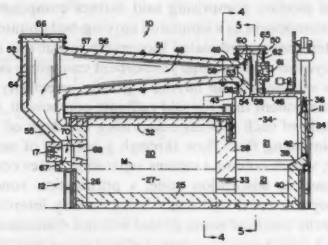
1. A process for forming very thin flakes of noble metal, said process comprising the steps of forming a dispersed phase of a substantially insoluble liquid reducing agent in a solution of a salt of said noble metal reducing said noble metal to metal flake at an interface of said dispersed reducing agent and said solution, and recovering said flake.

4,319,921

HEAT RECOVERY AND MELTING SYSTEM FOR SCRAP METALS

Jerry C. Pryor, Charleston Heights, S.C., and Roger E. Jenson, Sterling, N.Y., assignors to The Celotex Corporation, Tampa, Fla.

Filed Oct. 20, 1980, Ser. No. 198,339
Int. Cl.³ C22B *21/00*
U.S. Cl. 75—65 R 16 Claims



1. A melting furnace for reclaiming metals from metallic scrap material contaminated with combustibles comprising:

(a) an enclosed first chamber, the lower portion of which is a well for containing scrap material and molten metal, said first chamber having at least one outlet above the level of said molten metal for exhaust gases from said scrap material;

(b) an enclosed second chamber, the lower portion of which is a well for containing molten metal, said second chamber having

(i) at least one main burner port, and a main burner means associated with said main burner port for establishing a flame path through said main burner port and over said molten metal in said second chamber, and

(ii) an exhaust opening;

(c) means connecting said first chamber to said second chamber so that said molten metal in said first and second chambers can flow therebetween; and

(d) a circulating means associated with said first chamber outlet and external to said first and second chambers for circulating said exhaust gases from said first chamber outlet to said enclosed second chamber for incineration of said gases by said main burner means before their discharge through said exhaust opening.

4,319,922

RECOVERY OF GOLD FROM AN ETCHING SOLUTION

David I. Macdonald, Revere, Mass., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,993
Int. Cl.³ C22B *11/04*
U.S. Cl. 75—108 9 Claims

1. A method of recovering gold from an aqueous potassium iodide-iodine etching solution, which comprises:

adjusting the etching solution to a strongly basic pH to precipitate metallic gold from the etching solution; and

removing the precipitated metallic gold from the resulting alkaline solution.

4,319,923

RECOVERY OF GOLD AND/OR PALLADIUM FROM AN IODIDE-IODINE ETCHING SOLUTION

Bruno J. Falanga, North Andover, and David I. Macdonald, Revere, both of Mass., assignors to Western Electric Co., Inc., New York, N.Y.

Division of Ser. No. 106,993, Dec. 26, 1979. This application Oct. 3, 1980, Ser. No. 193,875
Int. Cl.³ C22B *11/04;* B44C *1/22*
U.S. Cl. 75—108 28 Claims

1. A method of recovering gold and palladium from an aqueous potassium iodide-iodine etching solution, which comprises:

adjusting the etching solution to a strongly basic pH to produce and alkaline solution and to precipitate metallic gold from the etching solution;

adding a borohydride compound to the alkaline solution to precipitate palladium from the resulting alkaline solution; and

removing the precipitated metallic gold and palladium from the resulting alkaline solution.

9. A method of regenerating an aqueous potassium iodide-iodine etching solution, which comprises:

adjusting the etching solution to a strongly basic pH to produce an alkaline solution and to precipitate metallic gold from the etching solution;

removing the precipitated gold from the resulting alkaline solution;

adjusting the alkaline solution to an acidic-to-neutral pH to change iodine compounds in the solution to iodine; and

adding potassium iodide and iodine, as necessary, to the solution to regenerate the etching solution.

4,319,924

LOW-TEMPERATURE CURING COATING COMPOSITION

Glenn A. Collins, Jr., late of Lansdale, Pa. (by Jean C. Lowe, executor), and James M. Klotz, Quakertown, Pa., assignors to Coatings for Industry, Inc., Souderton, Pa.

Continuation-in-part of Ser. No. 931,674, Aug. 7, 1978, abandoned, which is a continuation of Ser. No. 677,495, Apr. 15, 1976, abandoned, which is a continuation of Ser. No. 441,887, Feb. 12, 1974, abandoned. This application Apr. 28, 1980, Ser. No. 144,013
Int. Cl.³ C09D *5/10*
U.S. Cl. 106—14.12 13 Claims

1. In an acidic aqueous coating composition comprising, in coating-forming proportions, materials which are a source of: dissolved phosphate; dissolved dichromate; dissolved aluminum; and inorganic solid particulate material having a particle size of at least about one micron and capable of being bonded to a metallic surface by phosphate bonding; wherein said composition is capable of being heat-cured at elevated temperature within a predetermined time into a water insoluble coating in which particulate material of the coating is phosphate bonded to said surface; the improvement comprising including diethanolamine into said composition in an amount sufficient to reduce the temperature at which said composition can be cured within said predetermined time into said water insoluble coating.

4,319,925

COATING COMPOSITIONS FOR METAL CASTING MOLDS

William F. Brown, Colony, Tex., assignor to Weston Research Corporation, Rothschild, Wis.

Filed Mar. 6, 1981, Ser. No. 241,008
Int. Cl.³ B28B *7/36*
U.S. Cl. 106—38.27 6 Claims

1. A coating composition for coating the molding surfaces of molds for casting metal parts comprising an aqueous suspension containing (a) about 25 to about 55 weight % finely di-

vided zirconia, (b) about 10 to about 25 weight % colloidal silica, (c) about 15 to about 35 weight % mica, (d) about 2 to about 20 weight % finely divided zircon, (e) about 0.5 to about 6 weight % bentonite, (f) 0 to about 3 weight % of an inert coloring agent, all based on the total weight of (a)–(f), and sufficient water to provide a Baume' density of about 50° to about 80°.

4,319,926

CURABLE SILICATE COMPOSITIONS CONTAINING CONDENSED PHOSPHATE HARDENERS AND PH CONTROLLING BASES

Peter M. Nowakowski, Glenshaw; William G. Boberski, Gibsonia, and Jerome A. Seiner, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 22, 1980, Ser. No. 218,861
Int. Cl.³ C04B *19/04*
U.S. Cl. 106—74 **27 Claims**

1. An aqueous curable composition consisting essentially of:
(a) from about 10 to about 32 percent by weight of a water-soluble and/or water-dispersible alkali metal silicate; and
(b) from about 2 to about 10 percent by weight of a metal condensed phosphate hardeneer in the form of an aqueous dispersion, said aqueous dispersion containing a water-soluble base in an amount such that the pH of said aqueous dispersion of said hardener is greater than 9.5.

4,319,927

PORTLAND-TYPE CEMENTS

Robert M. Segal, Sparta, N.J., assignor to The Flintkote Company, Rochelle Park, N.J.

Filed May 7, 1980, Ser. No. 147,348
Int. Cl.³ C04B *7/02*
U.S. Cl. 106—89 **26 Claims**

1. A hydraulic cement composition comprising as hydraulically settable calcium silicates, alpha-prime dicalcium silicate in an amount of about 20 percent to about 70 percent by weight of said composition and tricalcium silicate in an amount of about 10 percent to about 50 percent by weight of said composition.

4,319,928

TECHNIQUE TO REDUCE THE ZEOLITE MOLECULAR SIEVE SOLUBILITY IN AN AQUEOUS SYSTEM

Santi Kulprathipanja, Hoffman Estates, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 2, 1980, Ser. No. 146,533
Int. Cl.³ C13D *3/14*
U.S. Cl. 127—46.2 **9 Claims**

1. A process for the separation of a component from a feed mixture comprising an aqueous solution of a mixture of components by contacting said solution with an adsorbent comprising a clay bound crystalline aluminosilicate dispersed in an inorganic matrix to selectively adsorb said component from said mixture which adsorbent has been previously used at least once before for the separation of a component from an aqueous feed mixture and which possesses a silicon constituent which tends to dissolve in said aqueous solution resulting in the undesirable disintegration of said adsorbent, wherein said used adsorbent is coated with a water permeable organic polymer to substantially reduce the extent of dissolution of said silicon constituent and thereby reduce the extent of disintegration of said used adsorbent during said separation of said component from said aqueous solution containing said mixture of components.

4,319,929

SIMULATED COUNTERCURRENT SORPTION PROCESS EMPLOYING ION EXCHANGE RESINS WITH PERIODIC BACKFLUSHING

R. Gene Fickel, Roselle, Ill., assignor to UOP Inc., Des Plaines, Ill.

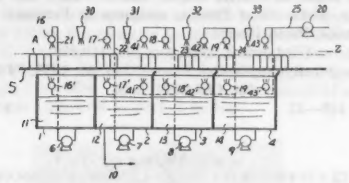
Filed Nov. 19, 1979, Ser. No. 95,767
Int. Cl.³ C13D *3/14*
U.S. Cl. 127—46.2 **15 Claims**

1. In a process for separating an extract component from a fluid feed mixture comprising said extract component and a raffinate component in a simulated moving-bed countercurrent flow system having simulated movement in but one direction by employment of a stationary adsorbent consisting essentially of an ion exchange resin having a greater selectivity for said extract component than for said raffinate component, the separation mode of such process comprising the steps of:
(a) maintaining fluid flow through a column of said adsorbent, which column contains separation zones comprising at least an adsorption zone, a purification zone, and a desorption zone, said zones being serially interconnected with the terminal zones of said column connected to provide a continuous connection of said zones, said fluid flow in said separation zones being in a single direction;
(b) maintaining said adsorption zone in said column defined by the adsorbent located between a feed input stream at an upstream boundary of said zone and a raffinate output stream comprising said raffinate component and said desorbent material at a downstream boundary of said zone;
(c) maintaining said purification zone immediately upstream with respect to said single direction, of said adsorptive zone, said purification zone defined by the adsorbent located between an extract output stream at an upstream boundary of said purification zone and said feed input stream at a downstream boundary of said purification zone;
(d) maintaining said desorption zone immediately upstream, with respect to said single direction, of said purification zone, said desorption zone defined by the adsorbent located between a desorbent input stream at an upstream boundary of said zone and said extract output stream at a downstream boundary of said zone;
(e) passing said feed mixture into said adsorption zone at adsorption conditions to effect the selective adsorption of said extract component by said adsorbent in said adsorption zone and withdrawing a raffinate output stream from said adsorption zone comprising said raffinate component and desorbent material;
(f) passing a desorbent material into said desorption zone at desorption conditions to effect the displacement of said extract component from the adsorbent in said desorption zone;
(g) withdrawing an extract output stream comprising said extract component and desorbent material from said desorption zone;
(h) periodically advancing through said column of adsorbent in a downstream direction with respect to fluid flow in said adsorption zone the feed input stream, raffinate output stream, desorbent input stream, and extract output stream, to effect the shifting of zones through said adsorbent and the production of extract output and raffinate output streams; and
(i) periodically backflushing said adsorbent by periodically passing a backflush mode stream through said feed input stream as the backflush input stream and withdrawing a backflushing output stream as the backflushing output stream from said column, said backflushing output stream being upstream, with respect to said single direction of said feed input stream to effect the periodic backflushing of said adsorbent located between said feed input stream and said backflushing output stream.

4,319,930
METHOD FOR MULTI-STAGE WASHING

Shunji Yano, and Tsunehisa Takahashi, both of Sagamihara, Japan, assignors to Daiwa Can Company, Limited, Tokyo, Japan

Filed Mar. 28, 1980, Ser. No. 134,974
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—10 **5 Claims**

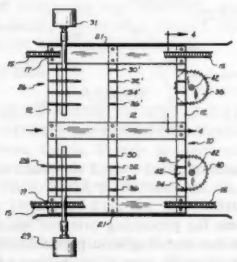


1. In a method for multi-stage washing wherein a treating tank is provided containing a treating liquid which is used for treating a material, wherein such treated material is advanced in a preselected direction from said treating tank above a plurality of washing tanks, each washing tank containing a washing liquid, the washing tanks being arranged in succession to the treating tank in series in such preselected advancing direction of the treated material, washing liquid being independently pumped from each of said washing tanks and sprayed against the treated material within a respective zone of registry of each of said washing tanks with said preselected advancing direction of the treated material at a first position in each such zone, fresh washing liquid being supplied to one of said washing tanks, the improvement wherein washing liquid is sprayed against the treated material also at a second position in at least one such zone, the washing liquid applied to the treated material at such second position having a lower concentration of treating liquid therein than the washing liquid applied to the treated material at said first position and being solely derived from a washing tank adjacent the washing tank in registry with said at least one such zone.

4,319,931
METHOD FOR NOTCHING PALLETS

Thomas O. Mills, 219 N. Maple, Douglass, Kans. 67039

Filed Feb. 25, 1980, Ser. No. 124,269
Int. Cl.³ B27C *5/00*
U.S. Cl. 144—326 R **8 Claims**



1. A method for notching the stringers of an assembled pallet comprising the steps of:

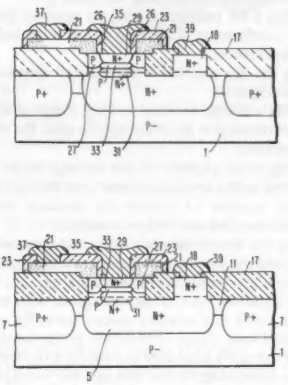
driving a pallet through a machine making four substantially vertical saw cuts in each stringer, the outer two cuts forming the sides of the notch; and

a second step of making a horizontal saw cut in said stringers with a blade having a downwardly extending arbor, said cut being normal to the vertical cuts with the saw blade arbor positioned to pass through the notch, the horizontal cut intersecting the four vertical cuts, first cutting free a section of the notch between the middle two vertical cuts allowing the saw blade arbor to pass through the stringer while cutting free the two outside sections of the notch to form the complete notch.

4,319,932
METHOD OF MAKING HIGH PERFORMANCE BIPOLAR TRANSISTOR WITH POLYSILICON BASE CONTACTS

Chakrapani G. Jambotkar, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 24, 1980, Ser. No. 133,156
Int. Cl.³ B01J *17/00*; H01L *21/265*
U.S. Cl. 148—1.5 **26 Claims**



1. A process for fabricating NPN bipolar transistors having a self-aligned polysilicon base contact in close-spaced relationship to the emitter contact therefor, comprising the following sequence of steps;

forming a layer of P+doped polysilicon on a substrate at least a portion of which is an N-type silicon material;

forming a layer of insulating material over said layer of P+doped polysilicon;

etching said layer of insulating material and polysilicon down to said N-type material to form an opening therethrough;

forming a thin layer of insulating material on said N-type material at the bottom of said opening and along the sidewalls of said polysilicon layer exposed by said opening;

diffusing the P+doping material from said polysilicon layer into said N-type silicon material to form an extrinsic base region;

etching by directional reactive ion etching the said thin layer of insulating material at the bottom of said opening as delineated by said sidewalls so as to remove the said insulating material at the bottom of said opening while leaving said insulating material on said sidewalls;

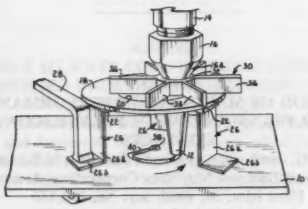
forming through said opening with insulating sidewalls an intrinsic P-type base region therebelow; and

forming through said opening with insulating sidewalls an N-type region above said intrinsic P-type base region, said N-type region forming a shallow N-type emitter.

4,319,933
BRIDGE AND DIE ATTACHMENT FOR CUTTING TORCHES

Rollo Shoesmith, Jr., 1101 E. Third St., Maryville, Mo. 64468

Filed Sep. 23, 1980, Ser. No. 189,761
Int. Cl.[3] B23K 7/10
U.S. Cl. 148—9 R 9 Claims



8. A method of cutting a hole in a workpiece with a cutting torch, said method comprising the steps of:

providing a die member having an opening therein substantially conforming in size and shape to the hole to be cut in the workpiece;

spacing the die member a preselected distance away from the workpiece;

providing a bridge member having a central aperture and a lateral dimension great enough to span the opening in the die member;

extending a tip portion of the cutting torch through said aperture in the bridge member until the torch engages the bridge member to control the distance the tip portion extends beyond the bridge member;

applying the bridge member to the die member in a manner to extend the tip portion of the torch through said opening and into proximity to the workpiece;

cutting a starting hole in the workpiece with the tip portion of the torch at a location spaced inwardly of the edge of the final hole which is to be cut in the workpiece;

moving the torch generally outwardly from the starting hole while continuing to cut through the workpiece until the torch engages the edge of the opening in the die member; and

moving the torch around the edge of the opening while continuing to cut through the workpiece.

4,319,934
METHOD OF FORMING TOOLS FROM ALLOY STEEL FOR SEVERE COLD FORMING

Gary S. Henning, Bloomingdale, Ill., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Division of Ser. No. 7,971, Jan. 31, 1979, abandoned. This application Jun. 18, 1980, Ser. No. 160,449
Int. Cl.[3] C21D 8/00
U.S. Cl. 148—12 F 7 Claims

1. A method of forming tools by severe cold forming of an alloy steel devoid of machining operations, including the steps of providing a solid metal slug having a predetermined volume, said metal slug being formed of an alloy steel consisting essentially of

from about 0.28% to about 0.33% by weight carbon,

from about 0.4% to about 0.7% by weight nickel,

from about 0.4% to about 0.6% by weight chromium,

from about 0.15% to about 0.25% by weight molybdenum,

from about 0.25% to about 0.65% by weight manganese,

up to about 0.15% by weight silicon,

from about 0.0005% to about 0.0035% by weight boron,

and the remainder being iron with minor amounts of impurities,

annealing said metal slug for spheroidization to a resultant hardness in the range from about R_B80 to about R_B76,

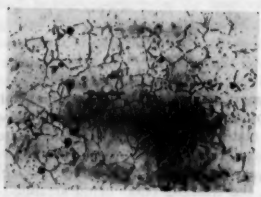
severe cold forming said annealed metal slug into the final shape of the tool,

and thereafter heat hardening said formed tool to a resultant hardness in the range from about R_C48 to about R_C52.

4,319,935
SUPERPLASTIC METAL ALLOYS HAVING A HIGH DEFORMATION RATE

Bernard Baudelet, Marly; Michel Suery, Verny, and Claude Homer, Metz, all of France, assignors to Pechiney Ugine Kuhlmann, Paris, France

Filed Jan. 8, 1980, Ser. No. 110,484
Claims priority, application France, Jan. 31, 1979, 79 03155
Int. Cl.[3] C22C 9/04
U.S. Cl. 148—32 1 Claim

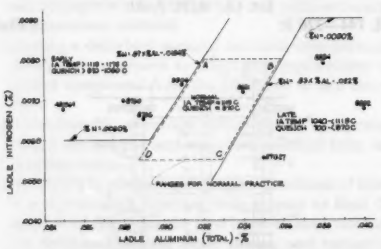


1. A superplastic brass alloy comprising at least two solid state phases comprising a major alloy constituent in globular or elongated particulate form having a minor alloy constituent on the boundry surfaces of the particles of the major constituents, said alloy consisting essentially of copper within the range of about 62.0–65.5% by weight with the balance zinc and up to 0.4% impurities.

4,319,936
PROCESS FOR PRODUCTION OF ORIENTED SILICON STEEL

Norris A. Dahlstrom, Hamilton, and Martin F. Littmann, Middletown, both of Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Dec. 8, 1980, Ser. No. 214,441
Int. Cl.[3] H01F 1/04
U.S. Cl. 148—111 4 Claims



1. In a process for producing oriented silicon steel having improved core loss and magnetic permeability in the rolling direction, comprising the steps of hot rolling a steel containing up to about 0.07% carbon, about 2.7% to about 3.3% silicon, about 0.05% to about 0.15% manganese, about 0.02% to about 0.035% sulfur and/or selenium, about 0.024% to about 0.040% total aluminum, about 0.0050% to about 0.0090% nitrogen, and balance essentially iron, subjecting the hot rolled steel to an initial anneal, cooling the steel, water quenching to a temperature below about 400° C. in less than about 200 seconds, cold rolling to final thickness, decarburizing the steel, applying an annealing separator, and subjecting the steel to a final anneal in

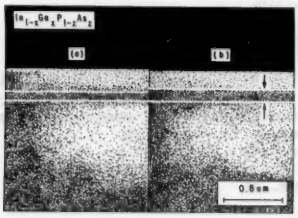
a reducing atmosphere, the improvement which comprises varying the temperature of said initial anneal within the range of from about 1040° to less than about 1115° C. and the temperature at which said water quenching is started within the range of from about 700° to less than about 870° C. when the total aluminum and nitrogen contents are to the right of and below the straight lines defined by percent nitrogen=0.0090% and percent nitrogen=0.83×percent aluminum−0.022% in FIG. 2 herein, and varying the temperature of said initial anneal within the range of from greater than about 1115° to about 1175° C. and the temperature at which said water quenching is started within the range of greater than about 870° to about 1090° C. when the total aluminum and nitrogen contents are to the left of and above the straight lines defined by percent nitrogen=0.0060% and percent nitrogen=0.83×percent aluminum−0.0184% in FIG. 2 herein.

4,319,937

HOMOGENEOUS LIQUID PHASE EPITAXIAL GROWTH OF HETEROJUNCTION MATERIALS

Nick Holonyak, Urbana, Ill., and Edward A. Rezek, West Los Angeles, Calif., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Nov. 12, 1980, Ser. No. 206,324
Int. Cl.³ H01L *21/208*
U.S. Cl. 148—171 **4 Claims**



1. A method for producing a homogeneous semiconductor layer upon a lattice matched semiconductor material substrate, comprising:

contacting said substrate with a melt of said semiconductor layer for a period of time which is less than the time required for steady-state diffusion-limited growth of said semiconductor layer to be established;

removing said substrate from contact with said melt for a time sufficient to allow the constiuent components of said melt to re-equilibrate; and

repeating said contacting and removing steps a sufficient number of times to achieve a desired thickness of said semiconductor layer on said substrate.

4,319,938

METHOD OF BUTT-JOINTING METAL TAPES COATED WITH A THERMOPLASTIC POLYMER FILM

Jean-Patrick Vives, Calais, France, assignor to Societe Anonyme dite: Les Cables de Lyons, Lyon, France

PCT No. PCT/FR79/00042, § 371 Date Jan. 10, 1980, § 102(e) Date Jan. 10, 1980, PCT Pub. No. WO79/01048, PCT Pub. Date Nov. 29, 1979
PCT Filed May 10, 1979, Ser. No. 186,024
Claims priority, application France, May 10, 1978, 78 13829
Int. Cl.³ G03D *15/04*
U.S. Cl. 156—49 **11 Claims**

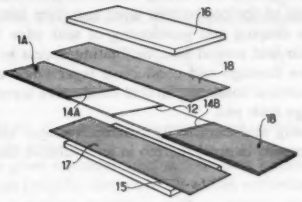
1. A method of butt-jointing tapes of a conductive metal coated on one or both sides with a film of a thermoplastic polymer material selected from the group consisting of a hybrid film of ionomer polymer for bonding to the metal and high-density polyethylene, and a polyisocyanate or epoxy resin adhesive for bonding a film of low-density polyethylene to the metal, as part of a process for manufacturing a composite product involving the continuous feeding of a tape of the metal coated with the thermoplastic polymer film, said method comprising the following steps:

(a) cutting the ends of the two tapes at predetermined matching oblique angles to the feed direction;

(b) detaching the thermoplastic polymer film from the end portion of each tape by immersion for a time interval just sufficient to detach the film in a solvent maintained at its boiling point;

(c) mechanically stripping the detached thermoplastic polymer film from the tape end portions;

(d) welding the end portions of the two tapes together;



(e) covering at least the stripped end portions of the two tapes with a polymer film bondable to the tapes by the application of heat, the portions of the tapes so covered being placed between two metal plates which have at least their surface in contact with the thermoplastic film coated with a heat-resistant material to which the film will not adhere;

(f) placing the metal plates between heated press plates and compressing them to a high pressure; and

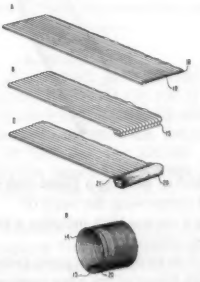
(g) rapidly cooling the press plates and moving them apart to enable the metal plates to be removed.

4,319,939

METHOD FOR MAKING CABLE HAVING A BUILT-IN CABLE SHIELD BONDING SYSTEM

Arnold R. Smith, Chester, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 53,798, Jul. 2, 1979, Pat. No. 4,260,851. This application Oct. 17, 1980, Ser. No. 197,901
Int. Cl.³ H01B *13/06, 13/26*
U.S. Cl. 156—56 **9 Claims**



6. A method for making an electrical cable comprising the steps of

binding a plurality of insulated conductors in close proximity to one another to form a cable core;

surrounding said cable core with a layer of insulative material;

forming an electrically conductive layer about said layer of

insulative material, said forming step further including the steps of

corrugating said electrically conductive layer to form a plurality of juxtaposed corrugations;

folding one edge of said conductive layer to form at least one generally flattened S-like fold;

coating at least exposed surfaces of said edge fold with an insulative layer;

imparting to said conductive layer a scored line adjacent said edge fold, said scored line extending linearly along the length of said cable; and

rolling said conductive layer with said edge fold about said cable core such that said coated edge fold surfaces are adjacent and facing said cable core and the other edge of the conductive layer laps over said edge fold, the shaping and positioning of said edge fold, along with said scored line, facilitating access to said cable core through said conductive layer while maintaining electrical continuity in said conductive layer along said edge fold; and

encasing said electrically conductive layer and all other elements internal thereto in an insulative sheath.

4,319,940

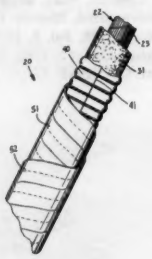
METHODS OF MAKING CABLE HAVING SUPERIOR RESISTANCE TO FLAME SPREAD AND SMOKE EVOLUTION

Candido J. Arroyo, Lilburn; Nicholas J. Cogelia, Duluth, and Ralph J. Darsey, Lawrenceville, all of Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J. and Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 89,788, Oct. 31, 1979, Pat. No. 4,284,842. This application Feb. 17, 1981, Ser. No. 235,362

Int. Cl.³ H01B *13/26, 7/34*

U.S. Cl. 156—56 **4 Claims**



1. A method of making a flame and smoke retardant cable, said method comprising the steps of:

advancing a core which includes a plurality of individually insulated conductors;

wrapping a strip of an inorganic cellular material about the core with longitudinal edge portions forming a longitudinal seam;

forming a metallic strip having at least one major surface characterized by an emissivity in the range of about 0.039 to 0.057 into a barrier which is generally concentrically disposed about the core such that the at least one major surface faces outwardly; and

wrapping a first and a second polyimide tape helically about the barrier.

4,319,941

DECORATIVE BUTTERFLY AND METHOD OF CONSTRUCTION

David A. Brownell, 332 E. Maplehurst, Ferndale, Mich. 48220

Division of Ser. No. 150,797, May 19, 1980. This application Oct. 27, 1980, Ser. No. 200,971

Int. Cl.³ A63H *33/16*

U.S. Cl. 156—61 **13 Claims**

1. A method of forming a decorative butterfly comprising the steps of; forming a plurality of parallel and alternately oppositely folded up and down pleats in a sheet of material; and securing the pleats together at a central portion (12) on the center line (14) which passes perpendicularly through the pleats while forming wings by allowing the pleats to fan out radially from the central portion (12) on either side of the center line (14).

4,319,942

RADIATION CURING OF FLOCKED COMPOSITE STRUCTURES

Walter Brenner, Teaneck, N.J., assignor to The Standard Products Company, Dearborn, Mich.

Filed Jun. 6, 1979, Ser. No. 45,863

Int. Cl.³ B32B *5/02;* **B05D** *3/06*

U.S. Cl. 156—72 **5 Claims**

1. A method of curing an adhesive composition used to bond a composite comprised of metal, rubber, and flock which comprises:

providing a metal substrate,

coating said metal substrate with an adhesive composition comprised of an elastomer, an ethylenically unsaturated polymerizable monomer, a tackifier, and an adhesion promoter,

providing a rubber substrate,

placing the bottom side of said rubber substrate in intimate contact with said adhesive on said coated metal substrate,

coating the top side of said rubber substrate with said adhesive composition,

depositing flock on said top side of said adhesive-coated rubber substrate, and

exposing said composite to high energy ionizing radiation to effect a cure of said adhesive.

4,319,943

FOLDED BEAD FILLER CONSTRUCTION

Douglas A. Bayuga, Wilson, N.C., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 8, 1980, Ser. No. 184,681

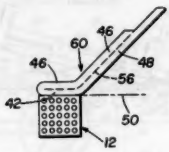
Int. Cl.³ B29H *17/32*

U.S. Cl. 156—136 **15 Claims**

1. The method of shaping and securing an uncured tire bead filler material to a tire bead ring, said method comprising:

(a) placing a piece of bead filler material completely over one of the outer peripheral and annular side surfaces of said bead ring, so that a first portion of said filler material covers said one surface and that a second portion of said filler material, exceeding the width of said one surface, extends transversely thereof in at least one direction;

(b) stitching said first portion of said filler material to said one surface;



(c) folding, juxtaposing and thereby adhering at least a part of said second portion of said filler material over and on at least said first portion of said filler material; and

(d) adjusting the final angular position of the remainder of said at least a part of said second portion of said filler material relative to said bead ring.

4,319,944

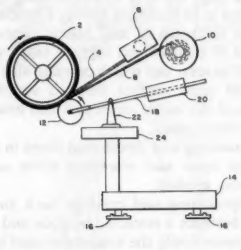
PROCESS FOR REINFORCING A THERMOPLASTIC BODY

Carl M. Pope, Dunwoody, Ga., assignor to Gulf Plastic Fabricated Products Company, Norcross, Ga.

Filed Jun. 11, 1980, Ser. No. 158,483

Int. Cl.³ B65H *81/00*

U.S. Cl. 156—195 **7 Claims**



1. A process for reinforcing a thermoplastic body composed of an organic thermoplastic polymer which comprises extruding a strip of hot organic thermoplastic polymer in a temperature range of about 150° to about 290° C., passing said strip of hot organic thermoplastic polymer and a strip of superimposed fabric onto a rotating cylindrical mandrel having a metal surface maintained at a temperature in the range of about 65° to about 140° C., helically winding said superimposed strips onto said cylindrical mandrel, with each layer of said polymer as it reaches the surface of said mandrel overlapping a previous polymer layer thereon, applying pressure of about 150 to about 400 pounds per square inch gauge to said superimposed strips sufficiently to at least partially embed said fabric into said organic thermoplastic polymer and to cause said polymer, as nodules, to protrude into the openings of said fabric and at least partially around individual fibers of said fabric by passing said strips between said cylindrical mandrel and a smooth pressure roller in close proximity to said cylindrical mandrel and thereafter cooling the resulting product to obtain a permanent mechanical bond between said fabric and said organic thermoplastic polymer, thereby forming a reinforced tubular article.

4,319,945

METHOD OF PRODUCING ASPHERICAL OPTICAL ELEMENTS

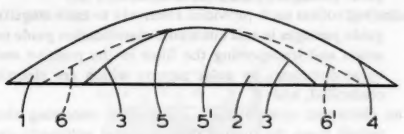
Harry Howden, Smallfield, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 14, 1979, Ser. No. 103,681

Claims priority, application United Kingdom, Dec. 28, 1978, 50127/78; May 16, 1979, 16961/79

Int. Cl.³ G02B *3/04, 1/10*

U.S. Cl. 156—212 **9 Claims**



1. A method of producing an aspherical optical element comprising the steps of

forming a glass substrate with at least part of one surface having an irregular surface finish and an aspherical profile having a surface accuracy with a surface irregularity varying within limits of +200 μm when compared to a desired aspherical profile, and

bonding a polymeric material to said one surface of said substrate, said polymeric material having a differential thickness sufficient to accommodate differences between the aspherical profile portion of said substrate and said desired aspherical profile, said polymeric material providing an overall optical surface finish to said irregular surface finish of said glass substrate,

said bonding step being carried out by the steps of

supporting said glass substrate in a moulding tool with said aspherical profile of said glass substrate being in close proximity to a moulding surface of said moulding tool, said moulding surface having a negative profile of said desired aspherical profile in an accuracy to within two fringes or less of sodium light per inch, and said moulding surface having a smooth optically finished surface finish,

filling regions between said glass substrate and said moulding surface with said polymeric material,

bonding said polymeric material to said one surface of said glass substrate,

moulding said polymeric material to a surface finish of said desired aspherical profile, and

releasing an aspherical optical element of said glass substrate and polymeric material from said moulding tool.

4,319,946

APPARATUS FOR CLASSIFYING AND REORGANIZING A PROCESSED LONG LENGTH OF FILM INTO LENGTHS OF FILM HAVING SAME FRAME SIZE

Shoji Inoue, No. 9, Aizumi-cho, Shinjuku-ku, Tokyo, Japan

Filed Oct. 22, 1980, Ser. No. 200,043

Claims priority, application Japan, Feb. 1, 1980, 55/11643

Int. Cl.³ B31F *5/00;* **G01B** *19/02*

U.S. Cl. 156—350 **4 Claims**

1. An apparatus for automatically classifying and reorganizing a processed long length of film connected together with a series of separate rolls of film having different frame sizes, into a plurality of lengths of film each having the same frame size, said apparatus comprising:

an optical detector for detecting the frame sizes of each film and the spliced portions of the films in said processed long length of film at an introducing section of the apparatus and then applying the detected data as electric signals,

an automatic cutter for cutting the spliced portions of the films having different frame sizes in sequence in said long length of film by an electric control,

an automatic reorganizing means for splicing the leading end of the cut long length of film and the trailing end of the previously cut film, each film having the same frame size, by placing the leading end and the trailing end of each of said films opposite with each other at the splicing position of an automatic splicing means by an electric control,

an automatic classification guide mechanism which comprises a plurality of stages of guide passages for classifying and separately delivering the films according to their frame sizes by way of vertically shifting and changing the guide passages by an electric control,

driving rollers each provided relatively to each stage of the guide passages in said automatic classification guide mechanism and transporting the films in the positive and reverse directions by pulse motors which are electrically controlled, and

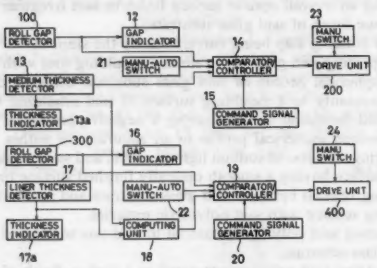
an electronic controller for controlling, receiving electric signals from the optical detector, said automatic cutter, automatic reorganizing means, automatic classification guide mechanism and pulse motors for driving rollers.

4,319,947

SINGLE FACER WITH AUTOMATIC ROLL GAP CONTROL SYSTEM

Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Kabushiki Kaisha (Rengo Co., Ltd.), Osaka, Japan

Filed Sep. 3, 1980, Ser. No. 183,834
Claims priority, application Japan, Sep. 7, 1979, 54-115914
Int. Cl.³ B32B *13/00*
U.S. Cl. 156—351 **3 Claims**



1. A single facer comprising a pair of corrugating rolls, a glue roll for glueing a corrugated medium, a press roll for pressing a linerboard against the corrugated and glued medium to paste them together, roll moving means for moving said glue roll and/or press roll toward and away from one of said corrugating rolls, and a system for controlling the clearance between said one of the corrugating rolls and said glue roll and/or said press roll, said system comprising;

a roll clearance detecting means for detecting the clearance between the rolls and giving a signal proportional to the clearance;

a thickness detecting means for detecting the thickness of said medium and/or said linerboard and giving a signal proportional to the thickness;

a comparator/controller means receiving the signal from said roll clearance detecting means and the signal from said thickness detecting means, comparing them with each other and giving a control signal proportional to the result of comparison; and

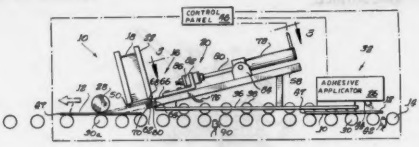
a driving means receiving said control signal to drive said roll moving means to move said glue roll and/or said press roll toward and away from said one of the corrugating rolls, whereby adjusting the clearance between these two rolls.

4,319,948

CARD-AFFIXING APPARATUS

Robert B. Volkert, 2940 Iroquois Rd., Wilmette, Ill. 60091, and John K. Volkert, 545 Thornwood La., Northfield, Ill. 60093

Filed Oct. 6, 1980, Ser. No. 194,473
Int. Cl.³ B01B *1/00*
U.S. Cl. 156—357 **1 Claim**



1. Apparatus for affixing a thin plastic card to a direct mail item or the like which carries a matching name, which apparatus comprises,

a card-affixing station,

a conveyer for moving printed substantially flat items carrying a name and address along a generally horizontal path past and below said card-affixing station,

means associated with said conveyer and generally upstream of said card-affixing station for applying an adhesive pattern to said item as it moves along said conveyer,

means associated with said adhesive applying means for detecting the arrival of said item upon said conveyer and actuating a spray mechanism to spray said adhesive pattern at a predetermined location upon said moving item,

a magazine at said card-affixing station for holding a stack of cards arranged in a sequence that is the same as the sequence of the items being conveyed,

card-sliding means including a carriage mounted in a track for reciprocating movement at an angle between about 10° and 25° to said conveyer path, which carriage has a notch in its leading edge defining a card-holding upper surface that terminates in an abutment having a height just slightly less than the thickness of said plastic cards and that is proportioned to contact and support said card over less than one-half its area, and which carriage also has aperture means in said upper surface through which vacuum is applied to hold the under surface of said lowermost card in the stack thereagainst,

means for maintaining said direct mail items in substantially flat condition upon said conveyer when said adhesive pattern is being applied,

means for reciprocating said carriage back and forth in a straight line between a retracted position and an extended position to remove only the lowermost card in said magazine from said stack and slide it forward and downward, and

roller means positioned above said conveyer at said station under which roller means said item passes,

said card-sliding means being designed so that said carriage, in its extended position, feeds a leading edge of the lowermost card into the nip between said roller and said conveyer as said portion of said item arrives which carries said adhesive pattern, whereby said card is affixed in a precise location upon the upper surface of a printed substantially flat item carrying a matching name.

4,319,949

MACHINE FOR HEAT SEALING POLYMERIC SHEETS INTO A SPIRAL DRUM

Christopher P. Thissen; Jerry J. Ferwerda; Milford J. Tweet, and Ronald D. Hatfield, all of Austin, Minn., assignors to Walker Process Corporation, Aurora, Ill.

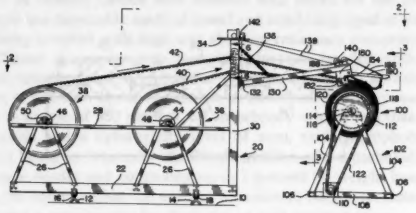
Filed Jul. 14, 1980, Ser. No. 168,732
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—446 **16 Claims**

1. A heat sealing machine for producing a drum of spirally

wound layers of thermoplastic polymeric sheet material heat sealed together comprising:

a rotatable horizontal shaft for receiving thermoplastic polymeric sheet material spirally wound thereon by rotation of the shaft;

a heat means adapted to be positioned between and adjoining a first polymeric sheet layer being spirally wound on the shaft and a prior layer wound on the shaft;



at least a portion of the heater means being readily formable into cylindrical shell segments of varying radii when positioned between the two polymeric sheet layers; and

support means, for the heater means, displaceable with respect to the shaft axis so that the heater means can remain radially adjacent a drum surface on which another spiral layer is to be heat sealingly attached.

4,319,950

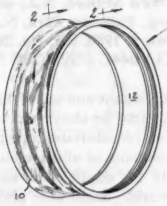
MANDREL FOR MAKING A COUPLING FOR RIGID PRESSURE PIPE

John L. Sznopek; Charles Lostak; Robert W. Heisler; Joseph P. Ferraro, and Henry J. Kazienko, all of Littleton, Colo., assignors to Manville Service Corporation, Denver, Colo.

Division of Ser. No. 918,226, Jun. 23, 1978. This application Mar. 31, 1980, Ser. No. 135,565

Int. Cl.³ B29C *1/00*; B29D *23/12*

U.S. Cl. 156—475 **5 Claims**



1. In a mold mandrel for forming a coupling for pipe by circumferentially wrapping a curable resin impregnated, reinforcing filament around the outer circumference of the mold mandrel and permitting the said resin to cure and form a filament reinforced resin body, said mold mandrel including a surface for supporting a rubber sleeve for embedment in said filament reinforced resin body formed thereby, said rubber sleeve having integrally formed gasket portions on both axial edges thereof and an integral liner between said gasket portions, the improvement comprising a removable support means for supporting said integral liner of said rubber sleeve during formation of said body, said support means including circumferential edges for being positioned between and in abutting relation to both said gasket portions, said support means including a relieved portion extending substantially along said circumferential edges for providing an annular space into which at least part of said gasket portions can thermally expand axially beyond said circumferential edges during exothermic curing of said resin body on said mold mandrel.

4,319,951

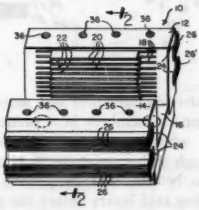
FIBER ORGANIZER FOR SPLICE CASES AND TERMINALS

Kenneth N. Korbelak, Jackson, and Joseph B. Masterson, Carteret, both of N.J., assignors to GK Technologies, Incorporated, Greenwich, Conn.

Filed Apr. 29, 1980, Ser. No. 145,009

Int. Cl.³ G02B *5/16*; B65H *69/06*

U.S. Cl. 156—502 **10 Claims**



1. Organizer apparatus for the orderly arrangement of reserve lengths of single or multiple fiber optic conductors including in combination an organizer body including two walls spaced from one another, a first plurality of spaced partitions extending along the outer surface of one of said walls, a corresponding plurality of spaced partitions extending along the outer surface of the other of said walls, the spacing between said partitions being sized for light frictional releasable engagement of individual optical fibers, a plurality of further-spaced partitions extending along the inner surface of one of said walls, jacketed fiber-optic cable means comprising an unjacketed length between jacketed lengths, thereby exposing individual optical fibers throughout the unjacketed length, and the unjacketed length being greater than five times the length of said body, the individual unjacketed fibers being coiled in at least two complete oval loops having opposed longitudinal sides, with a third partial loop in longitudinal overlap with one of said longitudinal sides, the jacketed lengths terminating adjacent opposite longitudinal ends of said one longitudinal side and wall, the fibers of a first loop adjacent one jacketed length and those of a second loop adjacent the other jacketed length being individually received and removably retained in the spaces between partitions of the other surfaces of both walls, thus leaving an intermediate partial loop between said first and second loop, and the fibers of said intermediate partial loop being received between the further-spaced partitions extending along the inner surface of said one wall.

4,319,952

RECIPROCALLY MOVING HOT-WIRE FOR BAG MAKING MACHINE

Gilmore T. Schjeldahl, 4436 Marlborough Ct., Minnetonka, Minn. 55343

Filed Dec. 29, 1980, Ser. No. 220,761

Int. Cl.³ B32B *31/00*; B29D *7/06*

U.S. Cl. 156—510 **7 Claims**

1. A machine for forming bags from thermoplastic film comprising, in combination:

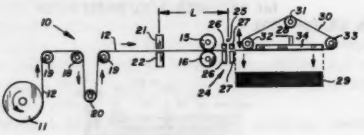
(a) supply means for dispensing continuous layers of superposed thermoplastic film sheet material in intermittent steps along a predetermined path;

(b) means disposed in said path for forming a bond zone of a predetermined width between said superposed layers of sheet material at spaced apart locations along said path, said bond zone extending transverse to said path; and

(c) cutting means disposed downstream of said lastmen-

tioned means for making a transverse cut through the approximate center of said bond zone, said cutting means comprising:

1. first and second reciprocally movable support members generally aligned with one another on opposite sides of said film path,
2. a hot wire element extending between said first and second support members and transverse to said film path,



3. means for driving said first and second reciprocally movable support members in a predetermined phase relationship whereby said hot wire is progressively passed through said bond zones from one side edge of said layers to the other with the portion of said hot wire first contacting said layers during the passage through one bond zone being the first to contact said layers during the passage through the adjacent bond zone.

4,319,953

METHOD FOR PRODUCING DISC OR BAND-SHAPED SI CRYSTALS WITH COLUMNAR STRUCTURE FOR SOLAR CELLS

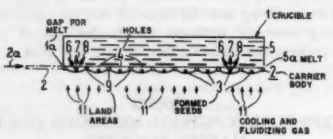
Josef Grabmaier, Berg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 8, 1979, Ser. No. 92,636

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1978, 2850790

Int. Cl.³ C30B *19/06*

U.S. Cl. 156—608 **9 Claims**



1. A method of producing disc or band-shaped silicon crystals having a columnar structure and useful in the manufacture of solar cells, comprising:

casting molten silicon through a gap located at the bottom of a crucible containing said molten silicon onto a band-shaped carrier body composed of a material which is resistant to said molten silicon, said carrier body having substantially uniform mesh openings which substantially define the crystalline columnar structures in said disc or band-shaped silicon crystals; and

cooling said carrier body by directing a stream of inert gas against the underside of said carrier body whereby silicon grows with a columnar structure in said mesh openings.

4,319,954

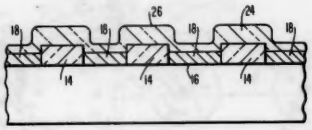
METHOD OF FORMING POLYCRYSTALLINE SILICON LINES AND VIAS ON A SILICON SUBSTRATE

Lawrence K. White, East Windsor, and Chung P. Wu, Mercerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 27, 1981, Ser. No. 238,804

Int. Cl.³ H01L *21/306*

U.S. Cl. 156—628 **10 Claims**



1. A method of forming polycrystalline silicon lines and vias on a silicon substrate comprising:

(a) forming an insulating layer on a surface of said substrate;

(b) removing areas of said insulating layer where said lines and vias are to be formed;

(c) depositing an amorphous silicon layer over the surface of said substrate;

(d) laser annealing said amorphous silicon layer, whereby said portions in contact with said silicon will be selectively converted into polycrystalline silicon; and

(e) selectively removing the remaining amorphous silicon areas.

4,319,955

AMMONIACAL ALKALINE CUPRIC ETCHANT SOLUTION FOR AND METHOD OF REDUCING ETCHANT UNDERCUT

Kenneth J. Murski, West Milford, N.J., assignor to Philip A. Hunt Chemical Corp., Palisades Park, N.J.

Filed Nov. 5, 1980, Ser. No. 204,216

Int. Cl.³ B44C *1/22*; C23F *1/00*

U.S. Cl. 156—659.1 **5 Claims**

4. A method of reducing the amount of undercutting beneath the resist-coated areas that lie above the copper and copper-containing alloy traces, on substrates, comprising the steps of:

(a) providing an ammoniacal alkaline etching solution consisting essentially of: cupric ions ammonium chloride; ammonium hydroxide; ammoniun phosphate-mono basic and water, and

(b) incorporating into said ammoniacal alkaline etching solution an organic undercut inhibitor for reducing the amount of undercutting beneath the resist-coated areas that lie above the copper traces, said organic undercut inhibitor being 5-nitro-1 H indazole.

5. A method of reducing the amount of under-cutting beneath the resist-coated areas that lie above the copper and copper-containing alloy traces, or substrates, comprising the steps of:

(a) providing an ammoniacal alkaline etching solution consisting essentially of: cupric ions; ammonium chloride; ammonium hydroxide; ammonium phosphate-mono basic and water, and

(b) incorporating into said ammoniacal alkaline etching solution an organic undercut inhibitor for reducing the amount of undercutting beneath the resist-coated areas that lie above the copper traces, said organic undercut inhibitor being pyrazole.

4,319,956

NONWOVEN WEB MATERIAL FOR MEDICAL TOWELS AND THE LIKE

Charles E. Snyder, Enfield, and Colin Elston, Windsor, both of Conn., assignors to The Dexter Corporation, Windsor Locks, Conn.

Filed Jun. 16, 1980, Ser. No. 159,681
Int. Cl.[3] D21H *3/44*
U.S. Cl. 162—146 10 Claims

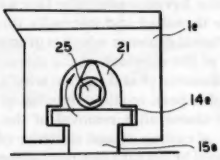
1. A bonded fibrous web material well suited for use as a single use disposable medical towel and exhibiting rapid rewettability coupled with high wet abrasion resistance comprising a fibrous nonwoven web material saturation bonded with a hydrophobic latex, said bonded web having a web abrasion loss of less than about 40 percent, an absorbent holding capacity in excess of 300 percent, an absorbency rate of less than 5 seconds and a cytotoxicity level of zero, said hydrophobic latex being an internally stabilized emulsion of a crosslinkable acrylic binder and containing up to 2 percent by weight based on the solids within the latex of a nonionic, polyol surfactant having a cytotoxicity level of zero at said concentration.

4,319,957

DEWATERING AND SUPPORT BAR FOR PAPERMAKING MESH

Heinrich Bartelmuss, 8863 Teufenbach 63, Austria

Continuation of Ser. No. 963,285, Nov. 24, 1978, abandoned.
This application Jul. 21, 1980, Ser. No. 170,655
Int. Cl.[3] D21F *1/54*
U.S. Cl. 162—352 8 Claims



1. In a papermaking machine wherein a dewatering mesh passes over and is supported on at least one dewatering bar extending transversely of the displacement direction of said mesh and having an elongated ceramic upper surface formed with a substantially planar top face meeting a front face at an acute angle at a front edge directed into said displacement direction, and wherein said bar is carried on and displaceable along a transversely extending support guide so that it can be drawn transversely out from underneath said mesh and can be reinserted transversely thereunder, the improvement wherein:

said upper surface and said edge are rounded inwardly from said faces at one end of said bar, whereby said bar can be displaced transversely under said mesh with said one end in contact therewith during displacement of said mesh without cutting said mesh; and

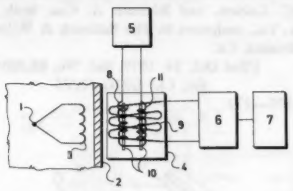
said bar and said guide being respectively formed with an interfitting T-section groove and ridge, said bar being provided with a rod parallel to said groove and having at least one lobe, said rod being pivotal between a position with said lobe bearing downwardly on said ridge and a position out of engagement with said ridge.

4,319,958

CIRCUIT ARRANGEMENT FOR CONTACTLESS TRANSMISSION OF TEMPERATURE INFORMATION FROM A FUEL ASSEMBLY OF A NUCLEAR REACTOR

Ladislav Fica, and Milos Cerny, both of Pilsen, Czechoslovakia, assignors to Skoda, oborovky podnik, Pilsen, Czechoslovakia

Filed Jun. 12, 1979, Ser. No. 47,807
Claims priority, application Czechoslovakia, Jun. 14, 1978, 3899-78
Int. Cl.[3] G21C *17/00*
U.S. Cl. 376—247 3 Claims



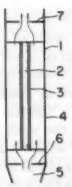
1. A circuit arrangement for contactless transmission of information about temperatures from a fuel assembly of a nuclear reactor, comprising a thermoelement situated inside said fuel assembly, and circuit means for processing the second and higher order harmonic frequencies magnetically and connecting said thermoelement with the winding of a coil located inside the fuel assembly, the magnetic field intensity of said coil generated by such a thermocouple being controlled by the fuel assembly temperature, a harmonic magnetic sensing element responsive to N times the fundamental frequency where N is an integer greater than two, said sensing element measuring the magnetic field intensity of the coil which is coupled with said harmonic magnetic sensing element.

4,319,959

METHOD OF SUPERVISING THE CHANNEL STABILITY IN REACTOR CORES OF NUCLEAR REACTORS

Kazuo Monta, Yokohama, and Yukio Takigawa, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 862,495, Dec. 20, 1977, abandoned.
This application Apr. 22, 1980, Ser. No. 142,688
Int. Cl.[3] G21C *7/00*
U.S. Cl. 376—245 7 Claims



1. In a boiling water reactor wherein a plurality of fuel assemblies constitute a reactor core and the fuel assemblies are cooled by a two-phase coolant flow which exhibits a density wave oscillation, a method of supervising the stability of said oscillation comprising the steps of determining a thermal power and a coolant flow quantity in each fuel assembly by signals produced by a plurality of in-core neutron flux detectors installed in said reactor core, and by signals regarding such operating conditions of said reactor core as inserted positions of control rods, a total flow quantity of the reactor core and the thermal power of the core determined by the heat balance of a nuclear power plant, judging the stability of said oscilla-

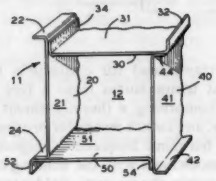
tion of each fuel assembly from said thermal power and the coolant flow quantity in said fuel assembly as well as from measured values of such parameters as inlet subcooling of the core and a pressure in a reactor vessel, or determining a stability limit of a selected one from said thermal power of the core or said total flow quantity of the reactor core or parameters described above, and comparing said stability limit with a measured value thereof so as to determine a stability margin.

4,319,960

MODULAR NUCLEAR FUEL ASSEMBLY RACK

Gordon C. Larson, and Richard A. Coe, both of Campbell County, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 24, 1979, Ser. No. 88,205
Int. Cl.³ G21C *19/20*
U.S. Cl. 376—272 **6 Claims**



1. A rack comprising:

a plurality of plates of flattened U-shaped cross section;

a plurality of cells, each including four of said plurality of plates interattached to form a compartment therein; and,

said plurality of cells being interattached in a square array forming a plurality of cavities, one between each adjacent pair of said cells, each of said cavities being of smaller cross-sectional area than each of said compartments.

4,319,961

FIXING DEVICE FOR DETACHABLY FIXING A HEATING ELEMENT

Jean Coussau, Paris, and Daniel Brunaud, Ouroux Saint Germain du Plain, both of France, assignors to Framatome, Courbevoie, France

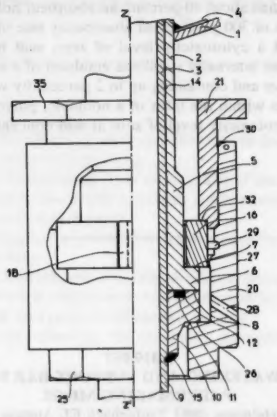
Filed Dec. 6, 1979, Ser. No. 100,874
Claims priority, application France, Dec. 12, 1978, 78 34944
Int. Cl.³ G21C *19/20*
U.S. Cl. 376—260 **1 Claim**

1. A entirely removable device for detachably fixing an elongate heating element, with an electrical resistance, which extends into the pressurizer of a nuclear reactor using pressurized water for heating the water in the primary circuit thereof and for keeping the water at constant pressure, the heating element extending inside a tubular sleeve which passes in a leaktight manner through the wall of the plate of the pressurizer, that end of the sleeve which is located outside the pressurizer being provided with a shoulder having two bearing faces extending perpendicular to the axis of the sleeve, the inner one of the bearing faces being directed towards the pressurizer, and the outer one of the bearing faces being directed outwardly thereof, said fixing device comprising an assembly of members having a symmetry of revolution and the axes coaxial with the axis common to the sleeve and to the heating rod, said members of said assembly comprising:

a collar which is adapted to be made integral with that end of the heating rod which is located outside the pressurizer, said collar having an inner face for bearing on the outer face of the shoulder of the sleeve with the interposition of gasket means for ensuring leaktightness between the rod and the sleeve to isolate the inside of the pressurizer from the external environment and an outer face;

a ring made of two identical parts delimited by a plane passing through said axis thereof, said ring being intended to bear on the inner face of the shoulder and having an external diameter which is greater than the external diameter of the shoulder and of said collar;

a nut comprising, from the outer end thereof intended to be located outwardly of the pressurizer to the inner end thereof closer to the pressurizer, a part of small internal diameter, which is bounded by a shoulder intended to bear on said outer face of said collar, a part of larger internal diameter, said diameter being greater than said external diameter of said ring, said part of larger internal diameter having an opening towards the outside for discharging leaking primary water and being arranged to be, in use, at



the level of the join between said collar and the sleeve, and a cutting zone having a circumferential groove arranged to be, in use, at the level of said ring, and an internally threaded part; and

a tubular collar having on its outer face a thread corresponding to the thread of said internally threaded part of said nut, an internal diameter which is greater than the external diameter of the shoulder of the sleeve but less than said external diameter of said ring on which said tubular collar is intended to bear, to allow removal of said tubular collar from said sleeve after removal of the two parts of said ring, free of cutting of said shoulder of said sleeve when said nut need be cut into two parts along said cutting zone.

4,319,962

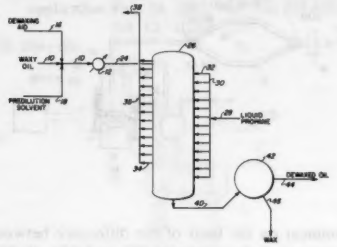
CONTINUOUS AUTOREFRIGERATIVE DEWAXING APPARATUS

Douglas R. Ryan, Rockaway, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 974,072, Dec. 28, 1978, Pat. No. 4,217,203. This application Nov. 5, 1979, Ser. No. 91,127
Int. Cl.³ C10G *43/08*
U.S. Cl. 196—14.5 **5 Claims**

1. A continuous, relatively low pressure autorefrigerative dewaxing apparatus for dewaxing waxy hydrocarbon oils comprising a vertical, elongated tower containing therein a plurality of vertically spaced stages, means for introducing waxy oil into the top of said apparatus and removing a wax-containing slurry from the bottom of said apparatus, each of said stages containing a liquid space, a vapor space above said liquid space, oil or slurry tray means for retaining said liquid oil or slurry, weir means for maintaining a predetermined amount of liquid on said tray means, downcomer means for providing a flow path for said liquid from a location above said stage to said liquid space of said stage, means for introducing cold

liquid autorefrigerant into at least some of said stages in a manner such that said liquid autorefrigerant directly contacts said oil or slurry in said stages thereby vaporizing at least a portion of said autorefrigerant, exit ports in at least some said



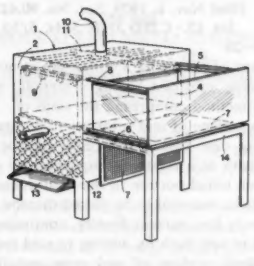
stages for removing vaporized autorefrigerant from at least some of said stages, and a manifold directly communicating with each of said exit ports, said exit port means and manifold means adapted to maintain the pressure between said stages substantially constant.

4,319,963

APPARATUS FOR THE STEAM EXTRACTION OF ESSENTIAL OILS FROM VEGETABLE MATERIAL

Etienne Legast, Chemin A. Jeandin, 22/8011, Thonex, Geneva, Switzerland

Filed Dec. 16, 1980, Ser. No. 217,034
Claims priority, application Switzerland, Jan. 7, 1980, 57/80
Int. Cl.³ B01D *3/38*
U.S. Cl. 202—170 **7 Claims**



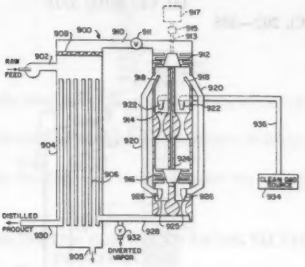
1. Apparatus for extracting oils from vegetable material comprising an enclosure including top, bottom and side walls, one of said side walls provided with an opening in the upper portion thereof, means to facilitate charging and emptying of said vegetable material while minimizing loss of heat, including a drawer for containing said vegetable matter, said drawer having side walls, an open top and a perforated bottom, said drawer insertable into and out of said enclosure through said side wall opening, first means outside of said enclosure and adjacent the lower edge of said opening for supporting said drawer for loading and unloading of said vegetable material, second means inside of said enclosure for supporting said drawer when it is moved through said side wall opening into said enclosure for treatment of said vegetable material, a source of steam connected to the top wall of said enclosure above the area occupied by said drawer containing vegetable material and directing steam downwardly over said material, a cooling and condensing compartment in said enclosure beneath the area occupied by said drawer and means for collecting the extracted oils at the bottom of the cooling compartment.

4,319,964

APPARATUS FOR HIGH VOLUME DISTILLATION OF LIQUIDS

Jerome Katz, and Sidney J. Fogel, both of Rochester, Monroe County, N.Y.

Division of Ser. No. 769,291, Feb. 22, 1977, Pat. No. 4,186,060, which is a continuation-in-part of Ser. No. 681,290, Apr. 28, 1976, Pat. No. 4,035,243. This application Aug. 10, 1979, Ser. No. 65,501
The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.
Int. Cl.³ C02F *1/06*
U.S. Cl. 202—172 **58 Claims**



1. A closed system for high volume distillation of impure liquids comprising:

(a) evaporator means, including means for supplying impure liquid feed thereto, for evaporating said impure liquid at a temperature above the freezing point of said liquid at ambient pressure and a pressure not exceeding a pressure corresponding to said evaporation temperature under saturated conditions;

(b) first compressor means receiving said vapor from said evaporator means for increasing said vapor pressure and temperature to predetermined pressure and temperature levels;

(c) expansion engine means motivated by a portion of said compressed vapor from said first compressor means, said engine being drivingly connected to said compressor means whereby the work done by said vapor in expanding in said expansion engine means is transmitted to said first compressor means;

(d) conduit means communicating said first compressor means with said expansion engine means for furnishing compressed vapor to said expansion engine means at substantially said predetermined pressure;

(e) means for supplying make-up work to said expansion engine means, said make-up work supplementing the work done on said engine by said vapor portion expanding therethrough;

(f) a first mixing chamber for receiving said expanded vapor exhausting from said expansion engine means;

(g) by-pass duct means for diverting the remainder of said compressed vapor from said first compressor means around said expansion engine means to said first mixing chamber for furnishing compressed vapor to said first mixing chamber at a pressure at least substantially equal to said predetermined pressure, said by-pass duct means including vapor injecting means for injecting said by-pass vapor into said first mixing chamber, said remainder of said compressed vapor admixing with and transferring heat directly to said vapor exiting said expansion engine means to form a second vapor;

(h) condenser means in heat transfer relationship with said impure liquid feed for receiving said second vapor from said first mixing chamber and for at least partially condensing said second vapor whereby the heat released by

said second vapor is transferred to said feed liquid to supply the heat energy necessary for evaporating said feed liquid;

(i) means for recovering condensate from said condenser means; and

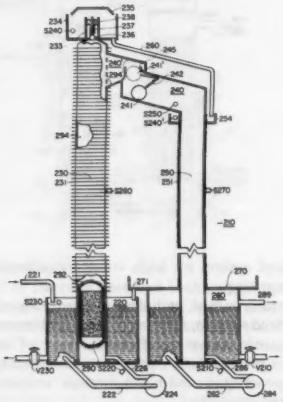
(j) means for removing unevaporated liquid feed from said evaporator means.

4,319,965

BAROMETRIC DISTILLATION SYSTEM

Sidney A. Parker, 5820 Diamond Oaks Dr. S., Fort Worth, Tex. 76117

Filed Sep. 18, 1980, Ser. No. 188,347
Int. Cl.³ B01D *3/10*
U.S. Cl. 202—205 **66 Claims**



1. A barometric distillation system comprising:

a first column of predetermined barometric height including energy imput means;

a second column of predetermined barometric height including energy rejection means;

means to intermittently vent said first and second columns including;

at least one means to vent at the highest point of said system;

means to pump an impure liquid into said first column;

means to pump purified liquid into said second column, and;

means communicating with said first and second columns permitting complete filling of said second column with said purified liquid, while preventing flow of said impure liquid into said second column when said first column is completely filled with said impure liquid.

4,319,966

TECHNIQUE FOR MONITORING SO_3, H_2SO_4 IN EXHAUST GASES CONTAINING SO_2

Gerald L. Carlson, and William M. Hickam, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 15, 1980, Ser. No. 197,368
Int. Cl.³ G01N *27/56, 27/58*
U.S. Cl. 204—1 T **7 Claims**

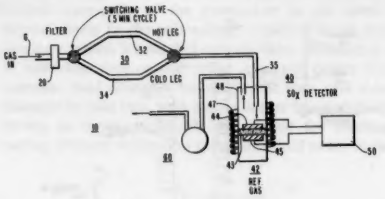
1. A method of monitoring SO_3, H_2SO_4 in the presence of SO_2 in a monitored gas environment containing H_2O comprising the steps of:

measuring the combined SO_2 and SO_3 content of a sample of the monitored gas environment;

separating SO_2 from the SO_3, and H_2SO_4 by cooling the sample to a temperature which is sufficient to convert SO_3 in the presence of H_2O to H_2SO_4, but which is not sufficient to condense SO_2;

measuring the SO_2 content of the sample following said separating step; and

determining the SO_3, H_2SO_4 content of the monitored gas



environment on the basis of the difference between the measurement of the combined SO_2 and SO_3, H_2SO_4 and the measurement of the SO_2 following said separating step.

4,319,967

FABRICATION OF PALLADIUM ANODE FOR X-RAY LITHOGRAPHY

Frederick Vratny, Berkeley Heights, and John M. Andrews, Jr., Watchuny, both of N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 1, 1979, Ser. No. 90,422
Int. Cl.³ C25D *5/10, 5/34, 5/50*
U.S. Cl. 204—29 **7 Claims**

1. A method of preparing a composite structure that comprises a metallic substrate having a metallic material plated thereon, said method comprising the steps of

polishing a surface of said substrate to a mirror finish,

flash plating onto said mirror-finish surface in a specified plating bath at a relatively high current density a relatively thin initial portion of the final desired thickness of said metallic material to be plated thereon,

at a relatively low current density, continuing to plate said material in said bath by adding to said initial portion an intermediate portion of said same metallic material to achieve a thickness of said metallic material less than the final desired thickness,

annealing the partially plated substrate to relieve stresses in the initial and intermediate portions of said plated material and to enhance adhesion between said portions and the substrate,

and, at said relatively low current density, continuing to plate said same metallic material in said bath to achieve the final desired thickness,

further comprising the step of

annealing said substrate, subsequent to said polishing step, to relieve stresses due to polishing,

and still further comprising the step of

annealing said structure, subsequent to said plating steps, to relieve stresses in the plated layer and to reduce the density of grain boundaries at the layer-to-substrate interface,

and wherein said substrate is made of a material selected from the group consisting of copper, gold and molybdenum, and wherein said plated layer is made of palladium.

4,319,968

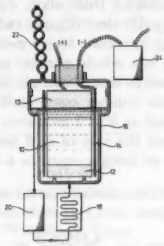
ELECTROLYTICALLY DECOMPOSING METHOD FOR IRON-CYANIDE COMPLEX

Atsuyuki Ueno, and Junichiro Yokota, both of Tokyo, Japan, assignors to Katsuhiro Okubo, Tokyo, Japan

Continuation of Ser. No. 54,697, Jul. 5, 1979, abandoned. This application Feb. 24, 1981, Ser. No. 237,616

Int. Cl.[3] C25B *1/00*

U.S. Cl. 204—96 6 Claims



1. A method for electrolytically decomposing iron-cyanide complexes comprising the steps of providing an electrolytic cell having a non-ferrous anode and a cathode, introducing into said electrolytic cell an electrolyte having a specific conductivity within the range of 5–25 mΩ/cm. and containing said iron-cyanide complex, applying a voltage between said electrodes to electrolytically decompose said iron-cyanide complex, while maintaining the specific conductivity of said electrolyte within said range, and oxidizing the cyan released thereby to form a cyanic-acid, and precipitating the iron ions released thereby in the form of hydroxide.

4,319,969

AQUEOUS ALKALI METAL CHLORIDE ELECTROLYTIC CELL

Yoshio Oda; Takeshi Morimoto, and Kohji Suzuki, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Aug. 14, 1980, Ser. No. 177,896

Claims priority, application Japan, Aug. 31, 1979, 54-110234

Int. Cl.[3] C25B *1/16, 1/26, 9/00, 11/03*

U.S. Cl. 204—98 8 Claims

1. An electrolytic cell having a gas-liquid permeable porous electrode layer on a cation exchange membrane, wherein said electrode layer is formed by screen printing a paste comprising a hydrophobic polymer and an electrode powder on the surface of said cation exchange membrane, wherein said electrode powder is a metal, an electroconductive metal oxide, or an electroconductive reduced metal oxide powder, and bonding said paste to said membrane by the application of heat and pressure.

4,319,970

METHOD AND APPARATUS FOR ELECTROLYTIC SEPARATION OF METALS, PARTICULARLY COPPER

Helmut Schatton, and Walter Krickau, both of Lünen, Fed. Rep. of Germany, assignors to Hüttenwerke Kayser Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 26, 1980, Ser. No. 134,090

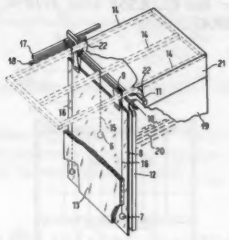
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912524

Int. Cl.[3] C25C *1/12, 7/00, 7/02*

U.S. Cl. 204—106 14 Claims

1. In a method for the electrolytic deposition of copper, in which at the beginning of the electrolytic deposition cathode sheets are inserted in the electrolyte of an electrolytic bath between anode sheets and are supported on respective cathode support rods, the improvement therein comprising the steps of:

fixing individual points of the cathode sheet surfaces by removably inserting punctiform spacing bodies between the cathode sheets and the anode, including spacing bodies unequally distributed on opposite sides of the cathode sheets;



supporting the spacing bodies depending from holding rods; and

supporting the holding rods on the cathode support rods.

4,319,971

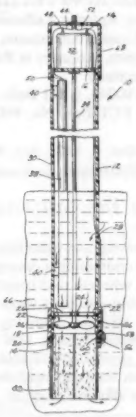
METHOD AND MEANS FOR RECOVERING SILVER BY ELECTROLYSIS

Dallis L. Good, Middlesboro, Ky., and David L. Good, Des Moines, Iowa, assignors to Metal Extraction Processes Corporation, Des Moines, Iowa

Filed Mar. 26, 1981, Ser. No. 247,722

Int. Cl.[3] C25C *1/22, 7/00*

U.S. Cl. 204—109 8 Claims



1. A method for extracting silver by electrolysis from a fluid solution having silver ions therein, said method comprising:

inserting an elongated hollow housing into said fluid;

driving impeller means within said housing so as to draw said fluid into said housing through an inlet opening located above said impeller means and so as to expel said fluid outwardly through an outlet opening below said impeller means;

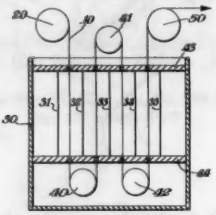
placing a negatively charged cathode in the path of fluid flow caused by said impeller means whereby said silver ions will be attracted to said cathode;

placing a positive charge on an anode located within said housing in the path of fluid flow caused by said impeller means.

4,319,972
AC ETCHING OF ALUMINUM CAPACITOR FOIL

Richard A. Bemis, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Dec. 12, 1980, Ser. No. 215,595
Int. Cl.³ C25F 3/04, 3/14
U.S. Cl. 204—129.43 3 Claims



1. A process for etching aluminum electrolytic capacitor foil comprising subjecting the foil intermittently to the action of AC current at 16 to 36 Hz frequency in a single stage in an aqueous bath consisting essentially of 0.75 to 1.8 M hydrochloric acid, 0.2 to 0.5 M aluminum chloride, and 0.05 to 0.4 M oxalic acid and at a temperature of 30° to 45° C. by passing said foil between a pair of electrodes in an insulated frame during which etching takes place and then out of the field of said electrodes during which no electrochemical etching takes place.

4,319,973
METHOD AND MACHINE FOR WASHING AND BLEACHING TEXTILES

Augusto Porta, Geneva; Antonin Kulhanek, Le Lignon, both of Switzerland; Alain Groult, Annemasse, and Herve' Tourrier, Valleiry, both of France, assignors to Battelle Memorial Institute, Carouge, Switzerland

PCT No. PCT/CH78/00043, § 371 Date Aug. 6, 1979, § 102(e) Date Jul. 23, 1979, PCT Pub. No. WO79/00346, PCT Pub. Date Jun. 28, 1979
PCT Filed Dec. 4, 1978, Ser. No. 129,976
Claims priority, application Switzerland, Dec. 6, 1977, 14876/77
Int. Cl.³ D06L 3/02; D21C 9/16; C25B 1/30
U.S. Cl. 204—133 13 Claims

1. A method for washing and bleaching textiles by means of an aqueous wash bath containing a detergent substantially free from bleaching agent, wherein said bleaching is carried out by the step of incorporating into said wash bath, at the required moment, an aqueous alkaline oxidizing agent containing in particular hydrogen peroxide ions, said aqueous alkaline oxidising solution being produced electrolytically, immediately before its incorporation into said wash bath, by reducing oxygen at a cathode in an alkaline medium.

4,319,974
UV CURABLE COMPOSITIONS AND SUBSTRATES TREATED THEREWITH

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,100
Int. Cl.³ C08G 65/10
U.S. Cl. 204—159.11 4 Claims

1. Curable or polymerizable compositions comprising by weight

(A) 15 to 100% of a $C_{(8-12)}$ α-olefin oxide,

(B) 0 to 85% of a polyfunctional epoxy resin,

(C) 0.1 to 10% based on the sum of the weight (A), (B) and (C) of an aryl onium salt of the formula,

$$[Y]^+[MQ_n]^-,$$

where Y is a member selected from

$$[(R)_a(R^1)_bI] \text{ and}$$

$$[(R)_c(R^2)_d(R^3)_eS],$$

where R is a monovalent aromatic organic radical, R^1 is a divalent aromatic organic radical, R^2 is a monovalent organic aliphatic radical selected from alkyl, cyano alkyl and substituted alkyl, R^3 is a polyvalent organic radical forming a heterocyclic or fused ring structure, M is a metal or metalloid, Q is a halogen radical, a is a whole number equal to 0 or 2, b is a whole number equal to 0 or 1, and the sum of a+b is equal to 1 or 2, c is a whole number equal to 0 to 3 inclusive, d is a whole number equal to 0 to 2 inclusive, e is a whole number equal to 0 or 1, and the sum of c, d and e is equal to 1 to 3 inclusive, and n is an integer equal to 4–6 inclusive.

4,319,975
DERIVATIZED AGAROSE AND METHOD OF MAKING AND USING SAME

Richard B. Cook, Rockland, Me., assignor to FMC Corporation, Philadelphia, Pa.

Filed Oct. 20, 1980, Ser. No. 198,372
Int. Cl.³ G01N 27/26, 33/16
U.S. Cl. 204—180 G 12 Claims

1. A method of separating biological mixtures by subjecting them to gel electrophoresis using as the gel matrix a derivatized agarose containing at least one substituent having a preselected conformational shape such that the pore diameter of the derivatized agarose is not reduced below about 10° A units, the D.S. being from about 0.001 to about 2.0, whereby the components in said mixture are separated as a function of their molecular size.

4,319,976
ELECTROPHORETIC TECHNIQUE FOR SEPARATING SERUM PROTEINS AND IMPROVED ELECTROPHORETIC GEL FOR USE THEREIN

William A. Gurske, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 19, 1981, Ser. No. 226,566
Int. Cl.³ G01N 27/26
U.S. Cl. 204—180 G 36 Claims

1. An electrophoretic gel of the type comprising a polysaccharide, characterized in that said electrophoretic gel further comprises an acid polysaccharide and salts thereof, wherein the acid moiety of said acid polysaccharide comprises at least one carboxyl group.

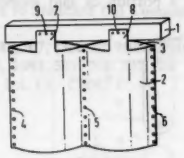
4,319,977
TWO-LAYER CORRUGATED ELECTRODE

John P. A. Wortley, Harborne, England, assignor to IMI Kynoch Limited, Birmingham, England

Filed Apr. 23, 1980, Ser. No. 143,149
Claims priority, application United Kingdom, Apr. 28, 1979, 14845/79
Int. Cl.³ C25B 11/02; C25C 7/02
U.S. Cl. 204—280 8 Claims

1. An electrode assembly comprising: an electrically conductive hanger bar having a longitudinal dimension; and an electrode formed of two continuous sheets of metal, at least one of the sheets being corrugated, the sheets being in face to face contact so as to form a series of parallel spaced-apart tubes

and being joined together along their areas of contact, said electrode being joined to said hanger bar along the longitudinal



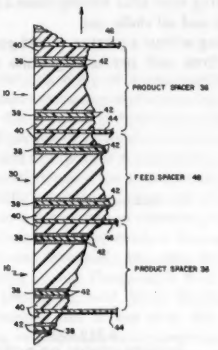
dimension thereof such that said tubes extend perpendicularly to said longitudinal dimension.

4,319,978

SPACER FOR ELECTRODIALYSIS STACK

William G. Millman, Middlebury, Conn., assignor to Lea Manufacturing Company, Waterbury, Conn.

Filed Dec. 30, 1980, Ser. No. 221,673
Int. Cl.³ B01D *13/02*
U.S. Cl. 204—301 **18 Claims**



1. A flow directing spacer for use between the cationic and anionic selective membranes of electrodialysis apparatus comprising an inner ply, two intermediate plies and two compressible outer plies, wherein the inside of each of said intermediate plies is bonded to a side of said inner ply, and the outside of each of said intermediate plies is bonded to one of said outer plies, wherein said bonds are formed of a pressure sensitive adhesive and wherein a turbulence promoting means is placed within a flow path defined by an aperature in said spacer, the aperature being the depth of the five said plies.

4,319,979

APPARATUS FOR EXTRACTING POLAR SUBSTANCES FROM SOLUTION

Arthur S. King, 8021 Cherokee La., Leawood, Kans. 66206

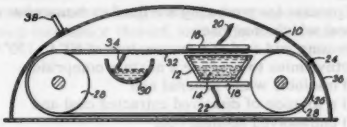
Division of Ser. No. 843,670, Oct. 17, 1977, Pat. No. 4,233,134. This application Aug. 8, 1980, Ser. No. 176,518
Int. Cl.³ B03C *9/00*
U.S. Cl. 204—302 **5 Claims**

1. Apparatus for use in extracting water from an aqueous solution including:

means for receiving a supply of the solution to be treated;

means for carrying a high voltage positive electrical charge;

means for locating said charge-carrying means in closely spaced, open communication with said receiving means for causing migration of water molecules from said solution to said charge-carrying means; and



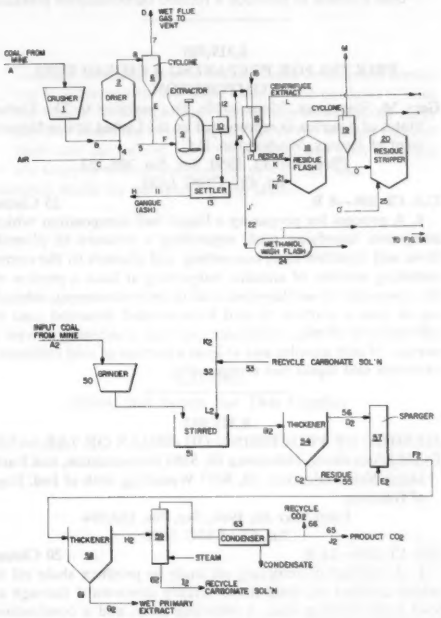
means for removing water on said charge-carrying means from close proximity with said solution in order to prevent return thereof to said solution.

4,319,980

METHOD FOR TREATING COAL TO OBTAIN A REFINED CARBONACEOUS MATERIAL

Rodman Jenkins, Suite 558, 1629 K St., NW., Washington, D.C. 20006

Filed Mar. 7, 1980, Ser. No. 128,127
Int. Cl.³ C10G *1/04;* C10L *5/00*
U.S. Cl. 208—8 LE **9 Claims**



1. A process for producing a refined carbonaceous material from initial coal which comprises:

(1) treating said coal at a temperature of 60° to 150° C. with methylamine to produce a mixture comprising:

(a) insoluble waste material

(b) a solution of extracted coal and

(c) undissolved residual coal

(2) discarding said insoluble waste (a) and separating said solution of extracted coal from said undissolved coal;

(3) subjecting said undissolved residual coal to a first treatment to remove a predominant amount of amine and then stripping said undissolved coal with a low molecular weight alcohol or naphtha vapor to remove remaining residual amine;

(4) removing said amine from said extracted coal solution to produce a refined carbonaceous product.

2. The process of claim 1 wherein said alcohol is of 1–4 carbons.

9. A process for producing a refined carbonaceous material from coal which comprises:

(1) treating said coal at a temperature of 60° to 150° C. with methylamine to produce a mixture comprising:

(a) insoluble waste material and

(b) a solution of dissolved extracted coal and

(c) undissolved residual coal

(2) discarding said insoluble waste (a) and separating said extract solution from said undissolved residual coal;

(3) subjecting said undissolved coal to a first treatment to remove a predominant amount of said methylamine and then stripping said undissolved coal with methanol to remove residual methylamine;

(4) treating said undissolved residual coal from (3) with additional hot methylamine, and then separating methylamine from said residual coal;

(5) subjecting said undissolved residual coal from (4) with hot methanol vapor to strip away remaining methylamine and then separating said residual coal from the methanol-methylamine mixture;

(6) removing methylamine from said dissolved extracted coal solution to produce a refined carbonaceous product.

4,319,981
PROCESS FOR PREPARING A LIQUID FUEL COMPOSITION

Gary M. Singerman, Monroeville, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 12, 1980, Ser. No. 205,223
Int. Cl.³ C10G *1/00*
U.S. Cl. 208—8 R **23 Claims**

1. A process for preparing a liquid fuel composition which comprises liquefying coal, separating a mixture of phenols from said liquefied coal, converting said phenols to the corresponding mixture of anisoles, subjecting at least a portion of the remainder of said liquefied coal to hydrotreatment, subjecting at least a portion of said hydrotreated liquefied coal to reforming to obtain a reformate and then combining at least a portion of said anisoles and at least a portion of said reformate to obtain said liquid fuel composition.

4,319,982
METHOD OF PROCESSING OIL-SHALE OR TAR SAND

Ewald Meisenburg, Höhenweg 60, 5351 Heimerzheim, and Karl-Heinz Keim, Dieselstr. 43, 5047 Wesseling, both of Fed. Rep. of Germany

Filed May 28, 1980, Ser. No. 153,894
Int. Cl.³ C10G *1/02*
U.S. Cl. 208—11 R **20 Claims**

1. A method of retorting oil shale to produce shale oil in which crushed oil shale flows serially downward through at least a pre-heating zone, a retorting zone, and a combustion zone which comprises:

(a) generating flue gas at an elevated temperature by burning in said combustion zone carbonaceous material on the spent oil shale from said retorting zone in the presence of an oxygen-containing gas introduced to said combustion zone;

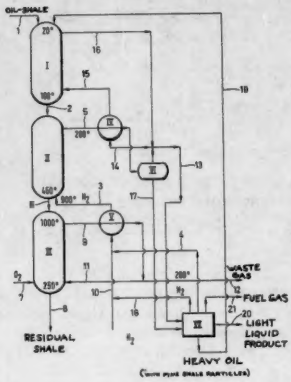
(b) withdrawing the flue gas from said combustion zone and recycling at least a portion thereof to said combustion zone;

(c) introducing a hydrogen-containing gas to said retorting zone after heating same a sufficient amount to provide heat for retorting pre-heated oil shale;

(d) said hydrogen-containing gas being heated by passage in indirect heat exchange with said flue gas withdrawn from said combustion zone;

(e) withdrawing vaporous product from said retorting zone and cooling and condensing it to separate therefrom a gaseous product, a light liquid product, and a heavy oil containing fine shale particles;

(f) introducing a portion of said gaseous product to said



pre-heating zone after heating same a sufficient amount to pre-heat said oil shale; and

(g) recycling at least a portion of said gaseous product withdrawn from said pre-heating zone to said pre-heating zone.

4,319,983
PASSIVATION PROCESS

Jin S. Yoo, Flossmoor, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed May 19, 1980, Ser. No. 150,863
Int. Cl.³ C10G *11/18, 47/12*
U.S. Cl. 208—114 **19 Claims**

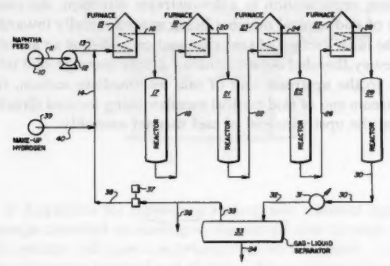
1. In a process for converting a hydrocarbon material having at least one metal contaminant selected from the group consisting of nickel, vanadium, iron and copper which comprises contacting the hydrocarbon material in a reaction zone at hydrocarbon conversion conditions with a catalyst to form a conversion product and a deactivated catalyst having carbonaceous deposits and containing at least a portion of said metal contaminant, and regenerating at least a portion of said deactivated catalyst to restore at least a portion of the catalyst activity by removing at least a portion of said carbonaceous deposits to form a regenerated catalyst, the improvement which comprises: contacting at least a portion of said regenerated catalyst with a liquid medium containing an effective amount of at least one silicon-containing material for passivating at least a portion of said at least one metal contaminant for a time sufficient to permit at least a portion of said silicon-containing material to interact with said portion of said regenerated catalyst to form a treated catalyst containing silicon atoms from said silicon-containing material, contacting at least a portion of said treated catalyst with an oxidative wash to form a washed catalyst, and transferring at least a portion of said washed catalyst to said reaction zone.

4,319,984

REFORMING WITH AN IMPROVED PLATINUM-CONTAINING CATALYST

Regis J. Pellet, Wheaton, Ill., and Ralph J. Bertolacini, Chesterton, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 86,707, Oct. 22, 1979. This application Feb. 24, 1981, Ser. No. 237,721
Int. Cl.³ C10G 35/06
U.S. Cl. 208—138 12 Claims



1. A process for the reforming of a hydrocarbon stream, which process comprises contacting said stream under reforming conditions and in the presence of hydrogen with a catalyst comprising a physical particle-form mixture of a Component A and a Component B, said Component A comprising at least one Group VIII noble metal deposed on a solid catalyst support material providing acidic catalytic sites and said Component B comprising rhenium or a compound of rhenium deposed on a solid catalyst support material, said catalyst having been prepared by thoroughly and intimately blending finely-divided particles of Component A and Component B to provide a thoroughly-blended composite, said finely-divided particles having a particle diameter that is less than 100 mesh (150 microns), and forming subsequently said composite into particles having a size that is greater than 100 mesh (150 microns) and being suitable for use in a hydrocarbon conversion reaction zone.

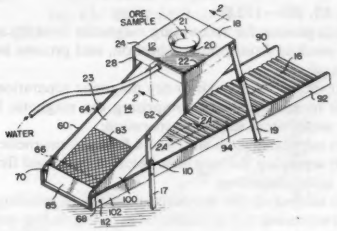
4,319,985

GOLD CONCENTRATOR

William M. Hibbard, McCall, Id., assignor to His Way, McCall, Id.

Filed Dec. 22, 1980, Ser. No. 218,977
Int. Cl.³ B03B 5/26
U.S. Cl. 209—3 12 Claims

1. A gold concentrator comprising:
a housing for receiving sand containing gold and rock particles;
a funnel on the housing for directing sand containing large rock and gold particles into the housing;
opposed depending flanges within the housing on opposite sides of said funnel;
a first sluice extending from beneath the housing;
a screen overlying a portion of said first sluice;
a second sluice intersecting the first sluice;
a mat on the second sluice, said mat having a series of grooves therein;
a hose connected to the housing for injecting a stream of liquid therein;
said liquid stream striking said opposed depending flanges causing turbulence thereof, said turbulent stream mixing



with the sand, said mixture, due to said turbulence, resulting in a suspension and separation of the particles within the liquid, said suspension gravitating downwardly onto the first sluice and over the screen at the bottom thereof then onto the second sluice whereby heavy gold particles are trapped within the grooves in the mat; and
support struts for the housing and sluices.

4,319,986

Patent Not Issued For This Number

4,319,987

BRANCHED ALKYL ETHER AMINES AS IRON ORE FLOTATION AIDS

Donald L. Shaw, Kingwood; Quentin T. McGlothlin, Spring; Barry M. O'Brien, Houston, all of Tex.; John W. Keck, and Wilfred L. Freyberger, both of Houghton, Mich., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 9, 1980, Ser. No. 185,456
Int. Cl.³ B03D 1/02
U.S. Cl. 209—166 13 Claims

1. A froth flotation process for separating silica from iron ore, which comprises frothing said ore in an aqueous medium in the presence of 0.1 to 2 pounds per ton of said ore of a water dispersible, liquid mixture of aliphatic ether amines having the general formula:

$$R—O—CH_2—CH_2—CH_2—NH_2$$

wherein R is a mixture of methyl branched aliphatic radicals having predominantly eight and ten carbon atoms and said branching being methyl radicals.

4,319,988

SEPARATION OF HIGH GRADE MAGNETITE FROM FLY ASH

Robert G. Aldrich, Manlius, N.Y., assignor to Halomet, Incorporated, Manlius, N.Y.

Filed May 5, 1980, Ser. No. 146,697
Int. Cl.[3] B02C *23/14*
U.S. Cl. 209—172.5 9 Claims

2. A process for recovering magnetite from fly ash obtained as a product from coal combustion, said process including the steps of:

(a) subjecting fly ash to dry magnetic separation;
(b) forming a slurry comprising the magnetic fraction obtained from said dry separation;
(c) subjecting such slurry to a first wet magnetic separation;
(d) screening the magnetic fraction from said first wet magnetic separation;
(e) subjecting the oversized particles to grinding;
(f) screening the products from said grinding step;
(g) subjecting the passed material from the screening steps (d) and (f) to a final wet magnetic separation; and
(h) separating a high purity magnetite from said final wet separation.

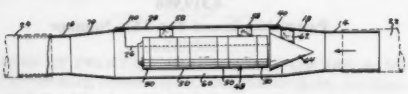
8. An integrated process for recovering magnetite from fly ash obtained as a product of coal combustion according to the process of claim 2 and for cleaning coal prior to its combustion, said process including the additional step of utilizing the magnetic product of the final wet magnetic separation in the heavy medium beneficiation of coal.

4,319,989

MAGNETIC SEPARATOR

Donald J. Wyland, Brighton, and Michael W. Stowe, Pontiac, both of Mich., assignors to Industrial Magnetics, Inc., Troy, Mich.

Filed Oct. 24, 1980, Ser. No. 200,462
Int. Cl.[3] B03C *1/02*
U.S. Cl. 209—225 3 Claims



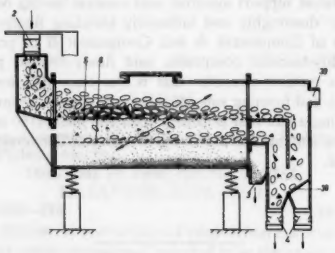
1. A magnetic separator assembly for a pneumatic conveyor of the type comprising a cylindrical conduit through which granular material is adapted to be conveyed in one direction while suspended in a high velocity air stream directed through the conduit, said separator assembly comprising a cylindrical duct having an inlet section at one end, an outlet section at its opposite end and an intermediate section extending axially between and connected at its opposite ends to said inlet and outlet sections, said inlet section being frusto-conically shaped with its upstream end corresponding in shape and size with said conduit for connection therewith, said inlet section being of progressively increasing cross section in a downstream direction, said intermediate section being concentric with the axis of said inlet section and having a uniform cylindrical cross section corresponding in size and shape with the downstream end of the inlet section, an axially extending cylindrical magnet assembly within said intermediate section concentric with the axis thereof, the outer peripheral surface of said magnet assembly being relatively smooth in an axial direction, said outer peripheral surface cooperating with the surrounding inner surface of the intermediate section to define an annular, axially extending passageway around the magnet assembly for the flow of air-suspended granular material in a downstream direction therethrough and to which surface magnetic particles in said air stream are adapted to magnetically adhere, said annular passageway having a uniform cross sectional area which is generally of the same size as the upstream end of said inlet section, said intermediate section having an opening therein which registers axially with said magnet assembly and through which said magnet assembly is adapted to be removed, a removable cover sealingly closing said opening, said magnet assembly being supported within said intermediate section on said cover, said inlet section having a conically shaped member supported concentrically therein and being of progressively increasing cross section in a downstream direction, the outer surface of said conical member being spaced radially inwardly from the inner surface of said inlet section to define an annular passageway therebetween extending axially through said inlet section to the upstream end of said intermediate section, the downstream end of said conical member being located directly adjacent the upstream end of said magnet assembly.

4,319,990

APPARATUS FOR THE DRY CLEANING OF GRAIN

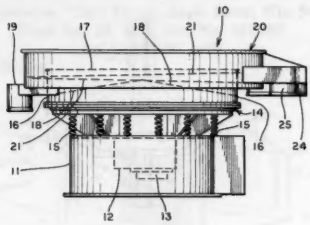
Roman Müller, Niederuzwil, Switzerland, assignor to Gebrueder Buehler AG, St. Gallen, Switzerland

Filed Jan. 18, 1980, Ser. No. 113,318
Claims priority, application Switzerland, Jan. 19, 1979, 553/79
Int. Cl.[3] B07B *1/46*
U.S. Cl. 209—240 17 Claims



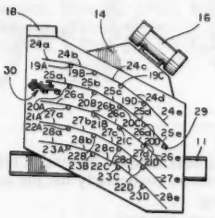
1. Screening apparatus for the dry cleaning of grain by removal of impurities, the apparatus comprising a casing of modular construction including a screen box in the form of a closed trough and housing at least one removable screen, a head section detachably mounted at one end of said screen box, said head section incorporating an inlet and internal guide means for directing material entering said inlet to one side of said at least one removable screen, a tail section incorporating a plurality of outlets and internal guide means for directing material passing through said at least one screen to one of said outlets and material retained by said at least one screen to another of said outlets, said screen box having means for accommodating different numbers of interchangeable screens and said guide means of said head and tail sections being adapted to be interchangeable with other such guide means, thereby providing different flow paths through said apparatus in dependence on the form and number of screens fitted in said screen box, wherein said head section is held in position by quick action releasable catches.

4,319,991
MATERIAL SEPARATING MACHINE
William J. Crone, Jr., Beach City, Ohio, and John P. Wright, Houston, Tex., assignors to Midwestern Industries, Inc., Massillon, Ohio
Filed Oct. 24, 1980, Ser. No. 200,413
Int. Cl.[3] B07B 1/55
U.S. Cl. 209—255 7 Claims



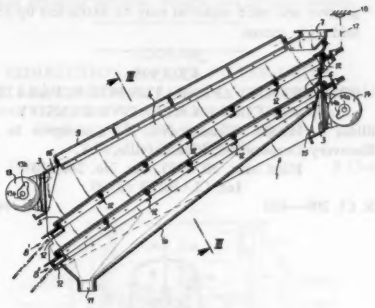
1. Apparatus for separating a composite material into three groups classified according to the screen size through which the groups will pass comprising first screen means receiving the composite material and allowing the grouping of the smallest sized material to pass therethrough, a trough at the periphery of said first screen means to receive the groupings of the largest and mid-sized of the materials, a discharge spout at the end of said trough, second screen means in said trough near said discharge spout, said second screen means being of a different mesh than said first screen means, and nozzle means above said second screen means to emit a spray of fluid material to wash the grouping of the mid-sized material through said second screen means with the grouping of the largest sized material moving through said discharge spout.

4,319,992
MATERIAL SEPARATING MACHINE
William F. Davis, Massillon, and Masataka Tsutsumi, Canton, both of Ohio, assignors to Midwestern Industries, Inc., Massillon, Ohio
Filed Oct. 28, 1980, Ser. No. 201,493
Int. Cl.[3] B07B 1/48
U.S. Cl. 209—275 7 Claims



1. Apparatus for separating a composite material into groups classified according to the screen size through which the groups will pass comprising a frame member, a plurality of vertically arranged supporting means carried by said frame member, each said supporting means including a plurality of supports, a screen element tensioned over each of said supporting means forming screen panels between said supports, each successive screen panel being downwardly inclined at a greater angle than the preceding screen panel so that material to be separated moves progressively faster as it traverses the screen element, a plurality of tensioning devices for each said screen element, and safety bar means connected to each of said tensioning devices of each said screen element to hold a said tensioning device in place should it break.

4,319,993
LARGE-CAPACITY POWER SCREEN
Rudolf Krause, Bad Homburg, Fed. Rep. of Germany, assignor to Rhewum - Rheinische Werkzeug- u. Maschinenfabrik GmbH, Remscheid, Fed. Rep. of Germany
Filed Dec. 16, 1980, Ser. No. 216,904
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 2951291
Int. Cl.[3] B07B 1/28, 1/30
U.S. Cl. 209—315 8 Claims

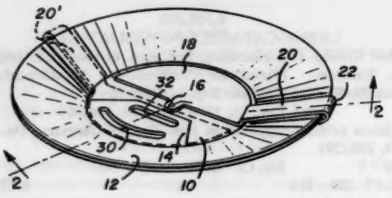


1. A screen apparatus comprising:
a generally planar frame inclined at an acute angle to the horizontal and having
a pair of spaced-apart longitudinal beams,
a pair of spaced-apart transverse beams bridging the ends of said longitudinal beams, and
a central longitudinal member between said longitudinal beams and having high and low ends secured to said transverse beams;
a generally planar screen inclined at an acute angle to the horizontal and spanning said beams;
means for mounting said frame for limited displacement relative to a fixed support; and
drive means including a pair of drive motors fixed to said central member and respective eccentrics carried by said motors for limitedly displacing said frame and screen relative to said support, one of said motors being mounted on said high end below the plane of said screen and the other of said motors being mounted on said low end above the plane of said screen.

4,319,994
GOLD MINING PAN
Ralph H. Morgan, 1363 Kingfisher, #3, Sunnyvale, Calif. 94087
Filed May 19, 1980, Ser. No. 151,276
Int. Cl.[3] B03B 5/04
U.S. Cl. 209—447 9 Claims

1. A gold mining pan comprising:
pan forming means including a circular bottom portion and a circumscribing outwardly flared frusto-conically configured wall portion, said bottom portion having an opening formed in an arcuate segment thereof;
slide means disposed beneath said arcuate segment and including an arcuate groove formed in the surface thereof facing said arcuate segment; and
means affixed to said bottom portion for holding the upper surface of said slide means in contact with the bottom surface of said bottom portion when said groove is in registration with said arcuate opening, whereby when said pan is swirled the more dense material included in a slurry

contained within said pan is caused to be separate from the remainder of the slurry and be collected within said



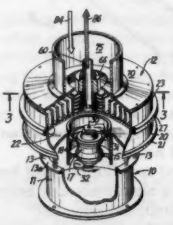
groove and such material may be extracted by removing said slide means.

4,319,995

PROCESS AND APPARATUS FOR SEPARATING PARTICLES BY RELATIVE DENSITY

William J. Haight, Pleasantville, N.Y., assignor to Mineral Recovery Corporation, Pleasantville, N.Y.

Filed Mar. 30, 1981, Ser. No. 249,223
Int. Cl.³ B07B *13/00*
U.S. Cl. 209—481 **44 Claims**



1. In a process for separating particles of selected relative density from an aggregated group of particles of predetermined size having different individual densities, wherein the particles are disposed upon a supporting surface in a particle bed, the particle bed is contacted by vertical reaction surfaces defining at least two intercommunicating annular channels, the vertical reaction surfaces having an eccentric lateral motion component and the supporting surface having a vertical motion component, said motion components fluidizing the particle bed to reduce the resistance thereof to lateral movement of individual particles therewithin, and moving such particles in a direction toward a collection zone bounded by one of said vertical reaction surfaces, the steps of:

simultaneously contacting the particles of said bed in said collection zone with a plurality of vertically spaced horizontal reaction surfaces disposed in said collection zone so as to enhance the fluidity of particles therewithin, thereby to enable denser particles to move into and remain in the collection zone in preference to less dense particles; and

providing a vertical barrier surface adjacent said collection zone to which denser particles may move laterally between said horizontal reaction surfaces and there remain in preference to less dense particles.

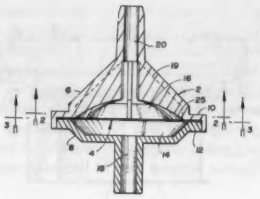
4,319,996

FILTER WITH INITIALLY FLAT MEMBRANE AND CURVED MEMBRANE SUPPORT

Monty E. Vincent, and Karlis Vizulis, both of Ann Arbor, Mich., assignors to Gelman Sciences, Inc., Ann Arbor, Mich.

Filed Nov. 10, 1980, Ser. No. 205,229
Int. Cl.³ B01D *33/00*
U.S. Cl. 210—188 **4 Claims**

1. A filter device comprising a housing having an inlet chamber with a fluid inlet opening and an outlet chamber with a wall having a fluid outlet opening, a deformable filter membrane separating said chambers and sealed to said housing, said outlet chamber containing a perforated membrane support surface of concave compound curvature spaced from the wall of the outlet chamber, said membrane being held by said hous-



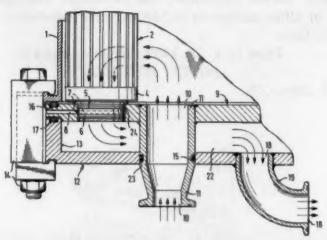
ing so as to be initially flat and spaced from said support surface, said membrane being sufficiently deformable so as to be forced into contact with and conform to the compound curvature of said support surface under normal transmembrane pressure when fluid flows through the membrane from said inlet chamber to said outlet chamber.

4,319,997

MULTIPLE FILTER CASE

Manfred Pett, Gleichen-Bremke, Fed. Rep. of Germany, assignor to Sartorius GmbH, Fed. Rep. of Germany

Filed Jun. 12, 1980, Ser. No. 158,791
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 7917272[U]
Int. Cl.³ B01D *27/00*
U.S. Cl. 210—85 **5 Claims**



1. A multipart filter case for holding at least one cartridge-shaped filter elcment, particularly for the sterile filtration of fluids, comprising:

a bell-shaped case top part;

an intermediate plate having at least one perforation and at least one cartridge-shaped filter element attached thereto said filter element having an end cap thereof sealed in said perforation;

a disk-shaped vase plate arranged parallel to the intermediate plate and provided with a filtrate outlet and defining with the intermediate plate a filtrate space;

a leakage control channel connecting the area between at least two ring packings with the outside of the case, the ring packings arranged longitudinally, spaced on the cap against the top part, the intermediate plate being sealed off in the top part by the ring packings

a filter inlet for the medium to be filtered protruding through

the base plate and the intermediate plate into the case top part and comprising a tubular connection integral with the intermediate plate and extending detachably and sealably through the base plate; and clamping means for fluidtight connections of the top part, the intermediate plate, and the dish-shaped plate at their peripheries with the packings

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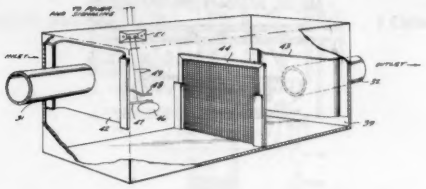
4,319,998

MONITOR FOR AN EFFLUENT DISPOSAL SYSTEM

John D. Anderson, Court House, Eagle River, Wis. 54521

Filed Jun. 25, 1980, Ser. No. 162,905
Int. Cl.³ C02C *1/02*
U.S. Cl. 210—86 **5 Claims**



1. In an effluent disposal system including an upstream septic tank, a downstream effluent disposal field, and piping interconnecting the septic tank to the disposal field, a septic monitor interposed in the interconnecting piping for monitoring suspended solids in the effluent passing through the interconnecting piping comprising,

a housing having an inlet and an outlet for coupling to the interconnecting piping,

screening means mounted in said housing for continuously intercepting effluent flow therethrough, with suspended solids in the effluent being continuously collected on the upstream side of said screening means, said screening means being removable for periodic servicing,

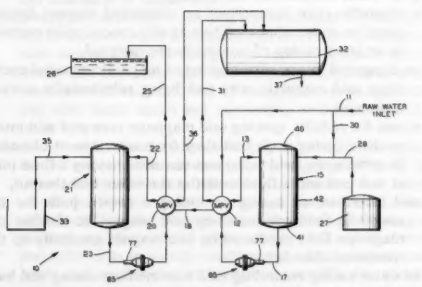
and automatic indicating means automatically responsive to an increased effluent level in said housing upstream of said screening means caused by a predetermined accumulation of suspended solids on said screening means to automatically provide an indication that the effluent disposal system requires servicing.

4,319,999

GRANULAR MATERIAL TRAP

Thomas L. Gruesbeck, Maumee, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Oct. 9, 1979, Ser. No. 82,744
Int. Cl.³ B01D *23/10*
U.S. Cl. 210—95 **2 Claims**



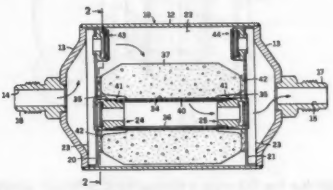
1. A liquid treating apparatus comprising: a tank containing a bed of granular material, means for supplying a liquid under pressure to said tank in which said liquid percolates through said granular bed, an outlet conduit connected to said tank adjacent the bottom thereof for conveying the liquid effluent therefrom, means for controlling the flow of said liquid into and out of said tank, strainer means within said tank normally retaining said granular material within said tank while permitting passage of said liquid effluent therethrough, means tapped into said outlet conduit downstream of said strainer means and said tank for trapping any granular material leaking past said strainer means and out of said tank, said trapping means including a hollow body comprised of opposed sections, angular flanges formed on said sections at the adjacent edges thereof, a screen interposed between said flanges, means urging said flanges toward each other to clamp said screen therebetween, a transparent pipe section connected at one end to said hollow body at the inlet end thereof to visually indicate the accumulation of any granular material filtered out by said screen.

4,320,000

BIDIRECTIONAL FLOW FILTER-DRIER

Harold T. Lange, and Eugene J. Ziegler, both of St. Louis, Mo., assignors to Sporlan Valve Company, St. Louis, Mo.

Filed Aug. 15, 1980, Ser. No. 178,495
Int. Cl.³ B01D *29/36*
U.S. Cl. 210—117 **5 Claims**



5. A filter-drier unit for heat pump systems, comprising:

(a) a shell having opposed ends, each shell end being provided with a flow port,

(b) spaced partitions in the shell providing a compartment therebetween, one partition separating one flow port from the compartment and the other partition separating the other flow port from the compartment,

(c) an outlet check valve connected to each partition,

(d) a perforated tube in the compartment and extending between and connected to the outlet check valves,

(e) a molded desiccant core in the compartment and disposed about the tube,

(f) an inlet check valve connected to each partition in laterally spaced relation to the outlet check valve connected to the same partition, to control flow from each flow port through an inlet check valve in one partition and into the compartment, through the core and tube, thence through an outlet check valve in the other partition, and out the other flow port,

(g) the flow ports being aligned on a longitudinal axis of the shell,

(h) the outlet check valves and tube being located at one side of the longitudinal axis of the shell for disposing the core closer to one side of the shell than the opposite side,

(i) the inlet check valves being located at the opposite side of the longitudinal axis of the shell and laterally of the core for communication with the compartment laterally of the core,

(j) each outlet check valve including a casing extending inwardly into the compartment from the partition to which the outlet check valve is connected,

(k) the perforated tube including opposite ends carried by the casings of the outlet check valves, and

(l) the core being provided with a bore receiving the tube, and being provided with end recesses spaced laterally from the tube at the connection of the tube ends with the valve casings, the tube engaging and supporting the core

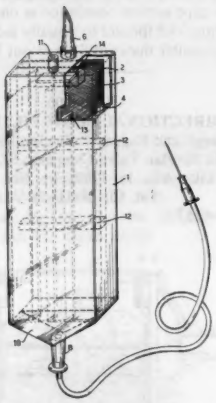
axially inward of the casings of the outlet check valves for minimizing shock impact damage to the core.

4,320,001

LIQUID FILTER HAVING REFINED VENT VALVE

Guy Le Boeuf, 9 rue Aristide Briand, Cormeilles en Parisis, France (95240)

Filed Mar. 14, 1980, Ser. No. 149,738
Claims priority, application France, May 17, 1979, 79 12619
Int. Cl.³ B01D *35/14*
U.S. Cl. 210—120 **11 Claims**



1. A device for filtering a physiological liquid, comprising a chamber for the circulation of said liquid, a filtering unit mounted across the liquid path through said chamber and dividing said chamber into at least two compartments and a one-way valve for the exhaust of overpressure air from a top part of said chamber, said valve being provided with an obturator integral with a float, said float positioned within said chamber and adapted to be lifted by a free level of said liquid in the vicinity of the valve, the said obturator cooperating with two opposed valve-seats for closing a passageway through the filtration chamber wall, in the absence of any gas-overpressure inside said chamber and under the thrust exerted by said liquid driving said float, whenever said free level is in the vicinity of said valve, respectively.

4,320,002

FILTER DEVICE

Makoto Ihara, 16-4, Nishikamata 5-chome, Ohta-ku, Tokyo 104, Japan

Filed May 6, 1980, Ser. No. 147,007
Claims priority, application Japan, May 8, 1979, 54-60185[U]
Int. Cl.³ B01D *33/06*
U.S. Cl. 210—178 **10 Claims**

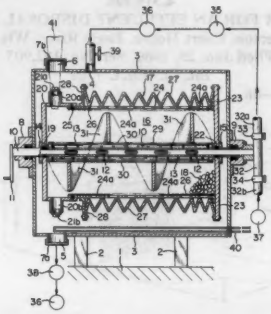
1. A cleaning filter device comprising:

a cylindrical tank having an inlet for liquid to be cleaned, an intake on said tank for a cleansing agent, and a discharge outlet on said tank for said cleansing agent,

axial pipe means extending through said tank, said pipe means having a handle at one end to rotate said pipe means freely relative to said tank, and a plurality of holes in said pipe means, said pipe means having an operating outlet extending externally of said tank,

a screw blade attached to said pipe means to rotate together with said pipe means;

a drum rotatably carried on said axial pipe means and disposed within said tank and around said screw blade, said drum having a cylindrical body and an end cover mounted on said cylindrical body such that said cylindrical body is rotatable relative to said end cover, said cylindrical body having a plurality of flow openings, said end cover having a cleansing agent inlet and a cleansing agent outlet, said cleansing agent being removed from said drum by rotating said pipe means by said handle to thereby rotate said screw blade which engages the cleansing agent in said drum to thereby move said cleansing agent axially to said cleansing agent outlet, and



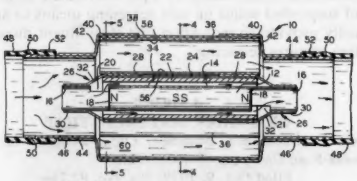
filter means disposed on the outer periphery of said cylindrical body of said drum so that when liquid to be cleaned flows into said tank through said tank inlet and is discharged through said operating outlet, said liquid passes through said filter means and said cleansing agent in said drum to thereby remove impurities from the liquid.

4,320,003

BYPASS WATER CONDITIONER

Charles H. Sanderson, and Charles W. Sanderson, both of Fort Wayne, Ind., assignors to Kemtune, Inc., Fort Wayne, Ind.

Filed Jan. 9, 1981, Ser. No. 223,695
Int. Cl.³ B01D *35/06;* C02B *1/00*
U.S. Cl. 210—222 **12 Claims**



1. A water conditioner comprising:

a magnetic core comprising an elongated magnet having opposite ends and at least two axially spaced poles encased in an inner casing of non-magnetic material,

an elongated intermediate casing of magnetic material encircling said magnetic core and being substantially coaxial therewith,

means for radially spacing said magnetic core and said intermediate casing such that they form a treatment chamber therebetween, said treatment chamber having a fluid inlet at one end and a fluid outlet at the other end thereof,

said intermediate casing providing a return path for the magnetic field produced by said magnet to confine the magnetic field produced by the magnet generally to the treatment chamber,

an outer casing encircling said intermediate casing and having an inlet and an outlet,

means for spacing said outer casing from said intermediate casing around at least a portion of the periphery of said intermediate casing to form therebetween a bypass chamber, said outer casing, inlet and outlet being separated

from the intermediate casing inlet and outlet to form at least two parallel connected flow paths for liquid flowing through the conditioner, one of the flow paths comprising the treatment chamber and the other flow path comprising the bypass chamber,

whereby the portion of the liquid flowing through the treatment chamber will be treated by the magnetic field and the remainder of the liquid which flows through the bypass chamber is not subjected to the magnetic field.

4,320,004

ANTI-RUST WATER TREATMENT APPARATUS

Rubin Schecter, 4811 NE. 12th Ave., Oakland Park, Fla. 33334

Filed Oct. 16, 1978, Ser. No. 951,474

Int. Cl.³ B01D *23/24, 27/12*

U.S. Cl. 210—266 **3 Claims**

1. An anti-rust water treatment apparatus for removing iron from water comprising:

a container having a water inlet, a water outlet spaced from said inlet, and support means confining a treatment bed between said inlet and outlet in a predetermined space inside said container;

said treatment bed comprising manganese zeolite particles occupying not more than two-thirds of said predetermined confined space and not less than one-half of said predetermined confined space, with the remainder of said predetermined confined space inside the container being empty to enable substantially all of the manganese zeolite particles to be tumbled vigorously in the container by backwashing with water under pressure which is introduced in the container at said outlet and discharged from the container at said inlet;

said support means for confining said treatment bed comprising an inlet screen unit in the container between said water inlet and said bed of manganese zeolite particles spaced above said treatment bed, and an outlet screen unit in the container between said bed of manganese zeolite particles and said water outlet and supporting said treatment bed from below;

each of said screen units including a foraminous screen means exposed for substantially more than 50% of the cross-sectional extent of the treatment bed so that nearly all of the treatment bed is exposed to backwash water introduced into the container at said outlet and flowing up through said foraminous screen means, and a pair of resilient split rings in axially confronting relationship to each other and each being radially compressible for slidable insertion into the container and radially expandable after such insertion for a tight fit in the container, said foraminous screen means being clamped between said rings and extending transversely across the interior of the container;

each of said split rings having circumferentially spaced slots which are open at the side of the respective ring which faces toward said foraminous screen means;

and cross bars slidably received in said slots and engaging the foraminous screen means to physically reinforce the latter on both sides thereof, said cross bars of each ring being substantially spaced from each other laterally of said ring so that substantially more than 50% of the area of said screen means is exposed for passing water to the treatment bed both during filtering and during backwash.

4,320,005

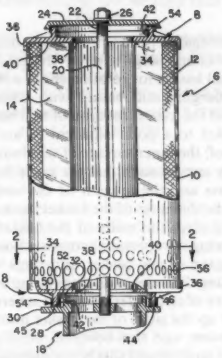
COALESCER OR FILTER END CAP

Howard T. DeGraffenreid, P.O. Box 261, Inola, Okla. 74036

Continuation of Ser. No. 22,685, Mar. 21, 1979, abandoned. This application Mar. 7, 1980, Ser. No. 128,310

Int. Cl.³ B01D *27/02*

U.S. Cl. 210—232 **8 Claims**



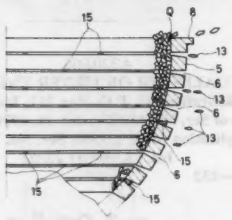
8. In combination: a mounting stool including a non-recessed sealing surface with a predetermined radial width; a coalescer or filter end cap comprising: a disc-like base portion having an upper surface adapted for supporting filter or coalescing media, said base portion having a peripheral edge and an opening extending therethrough, said opening being spaced radially inwardly of said peripheral edge, a skirt connected to said base portion on the opposite side thereof relative to said upper surface, said skirt extending generally downwardly away from said base portion and terminating in a lower surface, said skirt including a peripheral outer surface having a diameter smaller than the diameter of the peripheral edge of said base portion, an inner surface opposite said outer peripheral surface defining a counterbore having a diameter larger than the diameter of said opening, said skirt being generally cylindrical and the outer surface thereof lying in a single plane, and an annular U-shaped gasket means having a sealing surface for sealing against the mounting stool sealing surface, wherein the mounting stool sealing surface has a predetermined radial width substantially greater than the sealing surface of the gasket means so as to enable the gasket means sealing surface to seat against any portion of the entire sealing surface of the stool without the necessity for the gasket means to be tightly received in a recess in the stool surface, said gasket means being made of a resilient material having a bottom portion including said gasket sealing surface and including an opposite surface that overlies the skirt lower surface and sides extending upwardly along and overlying the skirt inner surface and peripheral outer surface, respectively, said gasket means bottom portion being compressed between the skirt lower surface and the mounting stool sealing surface; and one of coalescing and filter media supported on said base portion upper surface.

4,320,006

CENTRIFUGAL OIL SEPARATOR

Takefusa Kikuchi, Musashino, Japan, assignor to Taiyu Shoji Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1980, Ser. No. 111,110
Claims priority, application Japan, Jan. 16, 1979, 54/3505[U]
Int. Cl.³ B04B 3/00; B01D 33/10
U.S. Cl. 210—369 1 Claim



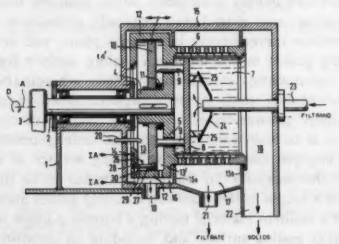
1. A centrifugal separator for separating the oil from oil coated chips comprising: a bowl shaped basket and means supporting said basket for rotation about a central vertical axis; a pipe for charging said basket with chips, said pipe being centered about the axis of rotation of said basket and extending into said basket to a point adjacent to and spaced from the bottom thereof; the inner surface of said basket being smoothly and upwardly curved such that the angle formed between the axis of rotation and the tangent of the surface progressively decreases as the diameter of the basket increases until the angle is or is nearly zero; the walls of the basket being formed by rings each having a trapezoidal cross-sectional shape; from the bottom to the top of said basket, said rings being of a progressively increasing diameter, said rings being vertically spaced to form a plurality of circumferential slits whereby all of the chips as they move up the sides of the basket must cross each of the slits in succession; said slits being of radially increasing width with the inner ends of said slits being narrower than said chips; said rings being joined to each other by welding at circumferentially spaced intervals.

4,320,007

PUSHER-TYPE CENTRIFUGE FILTERS

Günther Hultsch, Oberschleissheim, and Helmut Wilkesmann, Munich, both of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 4, 1980, Ser. No. 127,115
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1979, 2909716
Int. Cl.³ B01D 33/10
U.S. Cl. 210—376 10 Claims



1. A centrifuge filter comprising:

a sieve drum rotatable about an axis and having an inner surface forming an axially forwardly open sieve chamber;

means for feeding a filtrand into said sieve chamber;

means for rotating said drum about said axis and thereby centrifugally separating said filtrand into solids lying on said sieve surface and a filtrate passing radially outwardly through said drum;

a pusher plate axially displaceable in said drum between a rear end position and a front end position and having an outer edge closely juxtaposed with said surface, whereby axial forward displacement of said plate from said rear position to said front position scrapes said solids from said surface and pushes said solids forward in said chamber;

a cylinder rotationally fixed to said drum and forming a cylinder chamber centered on said axis and axially offset from said sieve chamber;

a piston axially subdividing said cylinder chamber into a front compartment and a rear compartment while being jointly axially displaceable with said pusher plate;

biasing means for urging said pusher plate and said piston jointly axially in one direction for reducing the axial length of one of said compartments and increasing the axial length of the other of said compartments, said one compartment being open and always substantially at ambient pressure;

means including a conduit extending from radially outside said surface of said drum into said one compartment for continuously introducing said filtrate into said one compartment and thereby filling same, whereby on rotation of said cylinder said liquid filtrate in said one compartment will be forced radially outwardly and will urge said piston axially in the direction opposite said one direction; and

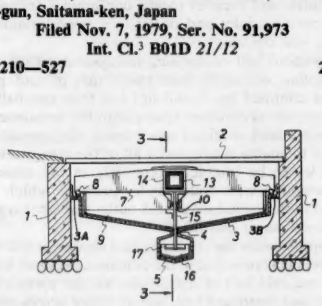
means for periodically draining said filtrate from said one compartment and thereby decreasing the force said filtrate exerts on said piston in said opposite direction to less than the force said biasing means exerts on said piston in said one direction, whereby said piston will periodically move back and forth and will similarly axially reciprocate said pusher plate to periodically scrape said surface of said drum.

4,320,008

APPARATUS FOR SEPARATING AND CONVEYING OF ANIMAL HOUSE WASTE MATERIALS

Fumiyuki Kokubo, 542 Ohaza Tsuzuranuki, Moroyamacho, Iruma-gun, Saitama-ken, Japan

Filed Nov. 7, 1979, Ser. No. 91,973
Int. Cl.³ B01D 21/12
U.S. Cl. 210—527 24 Claims



1. A liquid and solid material handling structure comprising: an elongated floor adapted to accommodate liquid and solid materials, said floor having a first end and a second end, means located below said floor having an elongated chamber extended in the direction of said floor, said floor having a longitudinal slit open to said chamber allowing liquid on the floor to drain into said chamber, means located adjacent the first end of the floor to receive solid material moved from the floor, means located adjacent the second end of the floor to receive liquid from the chamber, a frame movably supported on the floor, scraper means connected to the frame, said scraper means movable to a first position adjacent the floor to move solid material located on the floor to the means to receive solid material, and movable from the first position to a second position above the floor, first means connected to the frame and

extended through the slit into the chamber, second means located in the chamber movably connected to the first means, said second means movable to a first position to move liquid in the chamber to the means to receive liquid and from the first position to a second position, power means for selectively moving the frame in first and second directions along the length of the floor, said power means selectively operable to move the frame in the first direction along the length of the floor whereby said scraper means moves solid material on the floor to the means to receive solid material and to move the frame in the second direction along the length of the floor whereby said second means moves liquid in the chamber to the means to receive liquid, and connecting means attaching the frame and power means, said connecting means operable to move the scraper means to its second position when the power means moves the frame in the second direction whereby the scraper means does not move solid material on the floor.

4,320,009

PROCESSED ANTHOCYANIN PIGMENT EXTRACTS

Barney W. Hilton, Dallas; Robert I. Lin, Irving, and Michael G. Topor, Farmer's Branch, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Continuation of Ser. No. 818,721, Jul. 25, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,824

Int. Cl.³ B01D *13/00*

U.S. Cl. 210—651 **22 Claims**

1. A process for purifying an anthocyanin pigment extract containing undesirable components comprising subjecting the extract to ultrafiltration or dialysis using a semi-permeable membrane having a molecular weight cut-off of about 2,000 to 20,000 daltons, such that low molecular weight components pass through the membrane as permeate and anthocyanin pigments are retained as concentrate and also subjecting said extract to ion exchange to remove ions from said extract, whereby both the ultrafiltration or dialysis and the ion exchange serve to provide a purified anthocyanin pigment extract having enhanced stability and a reduced ability to support growth of yeasts.

4,320,010

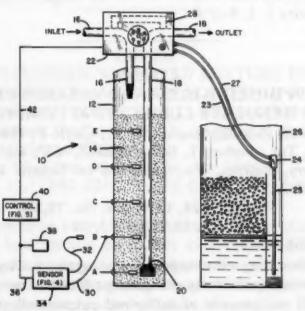
REGENERATION DETECTOR FOR WATER SOFTENERS

Mario A. Tucci, St. Paul, and George K. Sutherland, White Bear Lake, both of Minn., assignors to Sys-Tec, Inc., New Brighton, Minn.

Continuation of Ser. No. 114,848, Jan. 24, 1980, abandoned, which is a continuation of Ser. No. 23,635, Mar. 26, 1979, abandoned. This application Jul. 31, 1980, Ser. No. 173,988

Int. Cl.³ B01D *41/02*

U.S. Cl. 210—662 **8 Claims**



1. In water softening apparatus of the type including an elongated tank containing an ion exchange resin bed, a method for initiating regeneration of said bed when the hardness front reaches a predetermined location within said bed comprising the steps of:

(a) continuously measuring the self-generated electrical potential difference between predetermined spaced apart non-dissimilar metal electrodes in said bed as water is made to flow through said bed;

(b) sensing when a change of self-generated potential difference being measured exceeds a predetermined threshold and producing a first output signal indicative thereof;

(c) sensing when the rate of change with respect to time of said potential difference being measured exceeds a predetermined value and producing a second output signal indicative thereof; and

(d) logically combining said first and second output control signals and using said resultant signal to initiate a regeneration control apparatus.

4,320,011

OIL-CONTAINING WASTE WATER TREATING MATERIAL CONSISTING OF MODIFIED ACTIVE CARBON

Hiroshi Sato, Nagoya; Sadaaki Shigeta, Narashino, and Yasuo Takenaka, Otake, all of Japan, assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Filed Aug. 7, 1980, Ser. No. 176,052

Claims priority, application Japan, Aug. 13, 1979, 54-102936

Int. Cl.³ C02F *1/28*

U.S. Cl. 210—694 **7 Claims**

7. A method of removal of oil fractions from oil-containing waste water, comprising:

contacting said waste water with a bed of active carbon upon whose surface is chemically bonded at least one nitrogenous vinyl compound having at least one structure selected from the group consisting of amine structures, and quaternary ammonium structures.

4,320,012

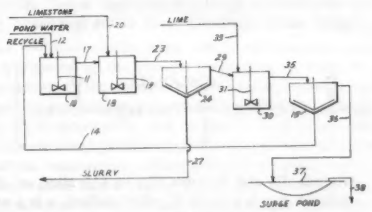
NEUTRALIZATION OF PHOSPHORIC ACID WASTE WATERS

Gordon F. Palm, and R. George Hartig, both of 602 Schoolhouse Rd., Lakeland, Fla. 33803

Continuation-in-part of Ser. No. 5,581, Jan. 22, 1979, abandoned. This application Aug. 7, 1980, Ser. No. 175,966

Int. Cl.³ C02F *1/52*

U.S. Cl. 210—713 **6 Claims**



1. Method for neutralization of acidic waste waters from phosphate plants to produce treated water suitable for disposal or use, said waste waters being acidic, having a pH in the range 1.5 to 2.1, and containing fluoride and phosphate materials in solution, comprising partially neutralizing said waste waters by adding one or more chemicals selected from the group consisting of calcium carbonate and calcium oxide to said waste waters to raise the pH thereof to the range 3.0 to 4.5 and to precipitate a substantial portion of said fluoride and phosphate materials therefrom as a non-flocculent first precipitate, separating said first precipitate from the resulting liquid phase, and finally neutralizing said liquid phase by adding calcium oxide to said liquid phase to further raise the pH thereof to the range

6.0 to 12.5 and to precipitate a substantial portion of said phosphate materials therefrom as a flocculent second precipitate and to produce treated water, said flocculent second precipitate being suspended in said treated water and difficult to separate therefrom, thickening said suspension of treated water and flocculent second precipitate to produce clarified treated water and a thickened slurry of flocculent second precipitate in treated water, and avoiding separation of said treated water and flocculent second precipitate from said thickened slurry by recirculating all of said thickened slurry for admixture to additional waste water at said pH in the range 1.5 to 2.1 prior to said addition of said selected one or more chemicals thereto whereby said flocculent second precipitate is redissolved in said waste water to be no longer present as solids requiring separation and said treated water in said thickened slurry being ultimately recovered as said clarified treated water without the necessity for undertaking the difficult separation of treated water and said flocculent second precipitate, the recirculated materials of said second precipitate being increased in concentration in said waste water to which they are added and being separated from the process as a portion of said first precipitate.

4,320,013

FABRIC CONDITIONING COMPOSITIONS

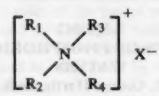
Frederick H. Lohman, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 10, 1980, Ser. No. 158,088
Int. Cl.³ D06M *13/46*
U.S. Cl. 252—8.8 **7 Claims**

1. An aqueous fabric conditioning composition comprising, by weight:

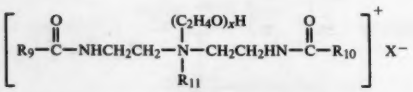
(a) from about 4% to about 8% of a substantially water-insoluble cationic fabric conditioning agent selected from the group consisting of:

(i) quaternary ammonium salts having the formula



wherein R_1 and R_2 represent alkyl or alkenyl groups of from about 12 to 22 carbon atoms, R_3 and R_4 represent alkyl groups containing from 1 to about 3 carbon atoms and X^- is a charge-balancing anion; and mixtures of (i) with

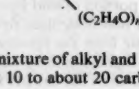
(ii) dihydrocarbyldiethylenetriamine based alkoxylated amido amine quaternary salts of the formula



wherein R_9 and R_{10} are C_{12} to C_{25} alkyl or alkenyl radicals, R_{11} is a C_1 to C_3 alkyl radical, x is a number from 2 to about 5, and X^- is a charge-balancing anion;

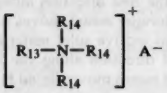
(b) from 0% to about 4% of a nonionic fabric conditioning agent which is an ester of a C_{10} to C_{26} fatty acid and a C_1 to C_{12} mono- or polyhydric alcohol;

(c) from about 0.3% to about 0.8% of a di-polyethoxy monohydrocarbyl amine having the formula



wherein R_{12} is a mixture of alkyl and alkenyl groups containing from about 10 to about 20 carbon atoms, wherein the average number of double bonds per molecule is from about 0.2 to about 0.7, wherein the sum of m plus n is from about 10 to about 25, and wherein m and n are each numbers greater than 1; and

(d) from about 0.4% to about 1.5% of a water-soluble quaternary ammonium surfactant of the formula



wherein R_{13} is an alkyl or alkenyl radical contaning from about 12 to about 20 carbon atoms, each R_{14} is an alkyl radical containing from 1 to 3 carbon atoms, and A^- is a water solubilizing anion; the total combined amounts of (a) and (b) being from about 4% to about 10%, the weight ratio of (c) to (d) being from about 0.4:1 to about 2:1, the weight ratio of (a)+(b) to (c)+(d) being from about 3:1 to 10:1, and the said composition having a pH of from about 3 to about 7.

4,320,014

ACIDIFICATION OF SUBTERRANEAN FORMATIONS EMPLOYING HALOGENATED HYDROCARBONS

Thomas A. Vivian, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 10, 1980, Ser. No. 195,979
Int. Cl.³ E21B *43/27*
U.S. Cl. 252—8.55 C **1 Claim**

1. In the in situ acidizing of a subterranean formation by decomposing a halohydrocarbon, the improvement which comprises introducing into said formation a mixture of carbon tetrachloride, water, isopropyl alcohol and ferric chloride, wherein the weight ratio of carbon tetrachloride to water to isopropyl alcohol to ferric chloride is from 2/5/1/0.04 to about 2/14,000/1/0.6.

4,320,015

MAGNESIUM SALTS OF N-CARBOXYAMINO ACID

Ronald J. Vaughan, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 29, 1979, Ser. No. 53,448
Int. Cl.³ C10M *1/54*
U.S. Cl. 252—33.6 **6 Claims**

1. A magnesium salt of an N-carboxyamino acid.

5. A lubricating oil composition comprising an oil of lubricating viscosity and from 0.5 to 30% by weight of the composition of claim **1**, **2**, **3** or **4**.

4,320,016

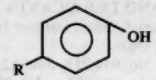
CARBON DIOXIDE-BLOWN OVERBASED CALCIUM ALKYLPHENOLATE LUBRICATING COMPOSITIONS

Benjamin H. Zoleski, Beacon, N.Y.; Gayle P. Herbert, Port Neches, Tex.; Rodney L. Sung, Fishkill, N.Y., and Robert M. Scarberry, Fairfax, Va., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 24, 1979, Ser. No. 78,346
Int. Cl.³ C10M *1/38*
U.S. Cl. 252—42.7 **10 Claims**

1. A lubricating oil composition comprising a hydrocarbon oil of lubricating viscosity containing a blend of between about 0.1 and 90 wt. percent of sulfurized calcium alkylphenolates having an alkylphenol to calcium metal ratio of about 1 to 1.4, a calcium content between about 0.5 and 12 wt. %, wherein said blend is produced by the steps of:

(1) contacting an alkylphenol of the formula:



where R is alkyl of from 5 to 50 carbons with a first addition of calcium alkoxyalkoxide of the formula:

$$Ca(O\text{-}A\text{-}OR')_2$$

where A is alkanediyl of from 1 to 6 carbons and R' is alkyl of from 1 to 25 carbons at a first temperature between about 250° and 410° utilizing a mole ratio of calcium alkoxyalkoxide to said alkylphenol of between about 0.225 and 1.

(2) contacting the resultant mixture with sulfur in the presence of a hydrocarbon lubricating oil at a second temperature between about 440° and 460° F. utilizing a mole ratio of sulfur to initial alkylphenol of between about 0.5:1 and 8:1, said hydrocarbon oil in said second step constituting between about 13 and 20 wt. % of said reaction mixture;

(3) contacting the mixture with a second addition of calcium alkoxyalkoxide at a temperature of between 400° and 425° F. in a mole ratio of calcium alkoxyalkoxide to initial alkylphenol of between about 0.45:1 and 0.9:1 in sufficient amount so that the total calcium alkoxyalkoxide employed in the first and third steps will total a mole ratio of calcium alkoxyalkoxide to initial alkylphenol of between about 1:1 and 1.2:1; said first and second addition totaling between about 130 and 300% of the stoichiometric amount of calcium alkoxyalkoxide to form said calcium alkylphenolate, said steps 1, 2 and 3 being conducted while sparging their respective reaction mixtures with an inert gas at a rate of between about 0.1 and 10 SCFH per gallon;

(4) hydrolyzing the blown mixture by steam sparging with at least 100% of the stoichiometric amount of steam required for complete hydrolysis of the calcium alkoxyalkoxide to calcium hydroxide at a temperature ranging from 350° to 410° F.; and thereafter,

(5) blowing the hydrolyzed mixture with about 20% of the stoichiometric amount of CO_2 at a gas rate of between about 0.1 and 10 SCFH/gallon required for partial carbonation thereby forming a blend of about 20% carbonate overbased sulfurized calcium alkylphenolate and about 80% hydroxide overbased sulfurized calcium alkylphenolate; said blend being present in said oil at a concentration sufficient to give said composition an alkalinity, expressed as total base number, of at least 10.

4,320,017

SULFURIZED/AMINATED MIXTURE OF ETHYLENE-BASED POLYOLEFIN AND POLYISOBUTYLENE FOR LUBRICATING OIL

J. Ronald Spence, Bartlesville, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 10, 1980, Ser. No. 196,030

Int. Cl.³ C08L *23/32, 23/36;* C10M *1/32, 1/38*

U.S. Cl. 252—43 **1 Claim**

1. A lubricating oil which comprises a major portion of a lubricating base oil and about 0.01 to 20 wt.% based on the lubricating oil of a dispersant viscosity index improper resistant to viscosity and molecular weight increase during production, which comprises the reaction product of an amine, sulfur or a sulfur-yielding compound and a mixture of polyisobutylene and a substantially amorphous polymer comprising ethylene and at least one monomer selected from the group consisting of a $C_{3\text{-}18}$ olefin, and a $C_{4\text{-}18}$ diene.

4,320,018

SYNTHETIC AIRCRAFT TURBINE OIL

Roberta Yaffe, Beacon, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 910,716, May 30, 1978, abandoned. This application Oct. 19, 1979, Ser. No. 86,543

Int. Cl.³ C10M *1/48*

U.S. Cl. 252—46.7 **10 Claims**

1. A synthetic lubricating oil composition consisting of a major portion of an aliphatic ester base oil having lubricating properties formed from the reaction of pentaerythritol or a polypentaerythritol or trimethylolpropane and an organic monocarboxylic acid having from about 2 to 18 carbon atoms per molecule and:

(a) from about 0.3 to 5 percent by weight of the lubricating oil composition of a phenylnaphthylamine or an alkyl or alkaryl phenyl naphthylamine in which the alkyl radical has from 4 to 12 carbon atoms,

(b) from about 0.3 to 5 percent by weight of a dialkyldiphenylamine in which the alkyl radical has from 4 to 12 carbon atoms,

(c) from about 0.01 to 0.5 percent by weight of a polyhydroxy-substituted anthraquinone,

(d) from about 0.25 to 10 percent by weight of a hydrocarbyl phosphate ester in which said hydrocarbyl radical contains an aryl ring and contains from about 6 to 18 carbon atoms, and

(e) from about 0.01 to about 0.5 percent by of a dialkyldisulfide containing from 4 to 20 carbon atoms in each alkyl group.

4,320,019

MULTI-PURPOSE ADDITIVE COMPOSITIONS AND CONCENTRATES CONTAINING SAME

Katsumi Hayashi, Mentor, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Apr. 17, 1978, Ser. No. 896,864

Int. Cl.³ C10M *1/32*

U.S. Cl. 252—51.5 A **52 Claims**

1. An additive composition which comprises a reaction product prepared by the process comprising the steps of:

(A) reacting, in the absence of free radical initiators, one or more interpolymers, prepared from ethylene, at least one C_3–C_8 α-monoolefin, and at least one polyene selected from non-conjugated dienes and trienes with at least one olefinic unsaturated carboxylic acid acylating agent at a temperature below that at which any substantial thermal degradation of any of said interpolymers takes place to form thereby one or more acylating reaction intermediates characterized by the presence of carboxylic acid acylating functions within their structure, said interpolymers having a minimum inherent viscosity of about 0.3 as measured in a 0.1 wt. percent solution in carbon tetrachloride at 30° C., and comprising about 30 to about 85 mole percent ethylene, about 15 to about 70 mole percent of said at least one C_3–C_8 α-monoolefin, and from about 0.5 to about 20 mole percent of said at least one polyene and

(B) reacting the one or more reaction intermediates formed in (A) with an N-(aminoalkyl)morpholine in an amount sufficient to substantially react with from about 50 to about 100% of the carboxyl acylating functions of said intermediates.

4,320,020

ALKYL AMINO PHENOLS AND FUELS AND LUBRICANTS CONTAINING SAME

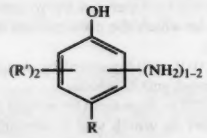
Richard M. Lange, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 676,172, Apr. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 622,358, Oct. 14, 1975, abandoned. This application Apr. 1, 1981, Ser. No. 249,770

Int. Cl.³ C10M 1/32

U.S. Cl. 252—51.5 R 48 Claims

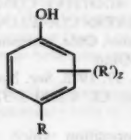
1. An amino phenol of the formula



wherein R is a substantially saturated hydrocarbyl substituent having an average of from about 30 to about 750 aliphatic carbon atoms; group R′ is a substituent selected from the group consisting of lower alkyl, lower alkoxyl, nitro, and halo; and z is 0 or 1.

18. An amino-containing composition made by

(I) nitrating with at least one nitrating agent at least one compound of the formula



wherein R is a substantially saturated hydrocarbyl group of about 30 to about 750 aliphatic carbon atoms; R′ is a substituent selected from the group consisting of lower alkyl, lower alkoxyl, nitro and halo; z is 0 or 1; to form a first reaction mixture containing a nitro intermediate, and

(II) reducing at least about 50% of the nitro groups in said first reaction mixture to amino groups.

25. A lubricant composition other than a two-cycle engine oil containing a major proportion of a lubricating oil of lubricating viscosity and about 0.05–30 parts by weight per 100 parts by weight of said oil of at least one amino phenol as described in claim 1.

30. A lubricant composition other than a two-cycle engine oil containing a major proportion of a lubricating oil of lubricating viscosity and about 0.05–30 parts by weight per 100 parts by weight of said oil of at least one amino-containing composition as claimed in claim 18.

33. An additive concentrate for use in normally liquid fuels or lubricating oils of lubricating viscosity comprising a substantially inert solvent/diluent and about 30–90% of at least one amino phenol as described in claim 1.

4,320,021

AMINO PHENOLS USEFUL AS ADDITIVES FOR FUELS AND LUBRICANTS

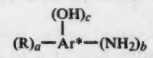
Richard M. Lange, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 914,710, Jun. 12, 1978, abandoned, which is a continuation-in-part of Ser. No. 892,529, Apr. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 676,172, Apr. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 622,358, Oct. 14, 1975, abandoned. This application Apr. 13, 1981, Ser. No. 253,830

Int. Cl.³ C10M 1/32

U.S. Cl. 252—51.5 R 25 Claims

1. A compound of the formula



wherein R is a substantially saturated hydrocarbon-based substituent of at least 30 aliphatic carbon atoms; a, b, and c are each independently an integer of 1 up to three times the number of aromatic nuclei present in Ar* with the proviso that the sum of a, b, and c does not exceed the unsatisfied valences of Ar*; and Ar* is a single ring or fused ring aromatic moiety having 0 to 3 optional substituents selected from the group consisting of lower alkyl, lower alkoxyl, nitro, halo, or combinations of two or more of said optional substituents; with the proviso that when Ar* is a benzene nucleus having only one hydroxyl and one R substituent, the R substituent is para to said hydroxyl substituent.

10. An amino-containing composition made by

(I) nitrating with at least one nitrating agent at least one compound of the formula

wherein R is a substantially saturated hyrocarbon-based group of at least 30 aliphatic carbon atoms; a and c are each independently an integer of 1 up to three times the number of aromatic nuclei present in Ar″ with the proviso that the sum of a, b and c does not exceed the unsatisfied valences of Ar″; and Ar″ is a single ring or fused ring aromatic moiety having 0 to 3 optional substituents selected from the group consisting of lower alkyl, lower alkoxyl, nitro, and halo, or combinations of two or more optional substituents, with the provisos that (a) Ar″ has at least one hydrogen atom directly bonded to a carbon atom which is part of an aromatic nucleus, and (b) when Ar″ is a benzene having only one hydroxyl and one R substituent, the R substituent is para to said hydroxyl substituent, to form a first reaction mixture containing a nitro intermediate, and

(II) reducing at least about 50% of the nitro groups in said first reaction mixture to amino groups.

19. A fuel composition containing a major proportion of a normally liquid fuel and about 1 to 10,000 parts by weight (per million parts fuel) of at least one compound as claimed in claim 1.

20. A fuel composition containing a major proportion of a normally liquid fuel and about 1 to 10,000 parts by weight (per million parts fuel) of at least one compound as claimed in claim 10.

22. A lubricant composition other than a two-cycle engine oil comprising a major proportion of at least one oil of lubricating viscosity and about 0.15–30 parts by weight (per 100 parts oil) of at least one compound as claimed in claim 1.

4,320,022

DRY GRANULAR CALCINED MAGNETIC FRACTION OBTAINED FROM CHRYSOTILE ASBESTOS TAILINGS

Pierre C. Aitcin, Sherbrooke, Canada, assignor to Societe Nationale de l'Amionte, Quebec, Canada

Filed Mar. 6, 1980, Ser. No. 127,547
Int. Cl.[3] C04B *35/04, 35/14*
U.S. Cl. 252—62.59 2 Claims

1. Process for preparing a granular calcined magnetic composition from chrysotile asbestos tailings, which consists essentially of magnetically separating chrysotile asbestos tailings passing a 4 mesh sieve, having an iron oxide content of about 10%, and MgO content of from 35 to 43%, an SiO_2 content of from 35 to 43%, recovering the magnetic concentrate fraction wherein the MgO content is from 25 to 43%, the SiO_2 content is from 25 to 43% and the Fe_2O is from 13 to 35%, and calcining said magnetic fraction at a temperature from about 1250° C. to about 1400° C. to provide a granular composition having an iron oxide content of from 15 to 40%.

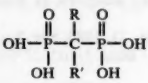
4,320,023

ANTIFREEZE FORMULATION USEFUL FOR RETARDING PRECIPITATION OF ALUMINUM CORROSION PRODUCTS IN THE COOLING SYSTEMS OF INTERNAL COMBUSTION ENGINES

Preston S. White, Corpus Christi, Tex., assignor to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 69,006, Aug. 23, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,257
Int. Cl.[3] C09K *5/00*
U.S. Cl. 252—75 6 Claims

1. A phosphate-borate ethylene glycol based antifreeze formulation especially useful for retarding precipitation of aluminum corrosion products in the cooling system of an internal combustion engine said antifreeze formulation containing from about 50 to about 500 parts by weight per million parts by weight of antifreeze of alkylene diphosphonic acid represented by the formula:



wherein R is hydrogen or C_1 to C_4 is alkyl; and R' is hydrogen, hydroxyl, amino or C_1 to C_4 alkyl.

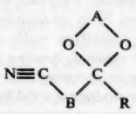
4,320,024

HYDRAULIC FLUIDS CONTAINING CYANO DERIVATIVES OF CYCLIC KETALS AND ACETALS

Robert L. Reierson, Midland, Mich.; Bart J. Bremmer, Ashland, and Joseph W. Hanafin, Framingham, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 16, 1980, Ser. No. 159,332
Int. Cl.[3] C09K *5/00*
U.S. Cl. 252—78.3 9 Claims

1. A hydraulic fluid composition comprising a cyano-substituted cyclic compound of from 5 to 20 carbons of the formula,

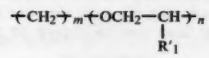


wherein:

R is hydrogen or a monovalent radical of from 1 to 10 carbons selected from branched or linear alkyl and cyano-, hydroxy-, alkoxy-, acyloxy-, siloxy- or organosiloxy-substituted derivatives thereof;

A is a divalent radical of from 2 to 10 carbons selected from alkylene and alkyl-, aryl-, cyano-, hydroxy-, cyanoalkyl-, hydroxyalkyl-, alkoxy-, polyalkoxy-, acyloxy-, siloxy- or organosiloxy-substituted alkylene; and

B is a divalent radical of from 2 to 10 carbons selected from the group consisting of branched or linear alkylene, and



wherein R'_1 is each occurrence hydrogen, methyl or ethyl and m and n are integers equal to or greater than 1; and

a remainder comprising at least one compound selected from the group consisting of cyano-substituted cyclic compounds of the above formula but different than the above cyano-substituted cyclic compound, hydraulic fluid components and hydraulic fluid additives.

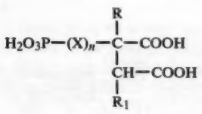
4,320,025

CAVITATION-INHIBITING, NONFREEZING, COOLING AND/OR HEAT TRANSFER FLUIDS

Klaus Diebel, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 20, 1980, Ser. No. 198,378
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1979, 2942864
Int. Cl.[3] C09K *5/00;* C23F *11/10*
U.S. Cl. 252—78.5 8 Claims

1. A cavitation-inhibiting, nonfreezing, cooling and/or heat-transfer liquid comprising water, a glycol, a cavitation-inhibiting effective amount of at least one phosphonocarboxylic acid of the formula



wherein

R is H, C_{1-6} alkyl, or C_{1-6} alkyl substituted by carboxy,

R_1 is C_{1-3} alkyl, or C_{1-3} alkyl substituted by carboxy,

X is C_{1-3} alkylene, C_{1-3} alkylene substituted by COOH or PO_3H_2 groups, and

n is 0 or 1,

and a corrosion inhibitor which is not a phosphonocarboxylic acid of said formula.

4,320,026

ALKALINE DETERGENT COMPOSITION AND METHOD OF INHIBITING DISCOLORATION OF SAID DETERGENT COMPOSITION

Fely B. Cristobal, Fremont, Calif., and Robert W. Newsbaum, Mahopac, N.Y., assignors to Brent Chemicals Corporation, Stamford, Conn.

Filed Dec. 1, 1978, Ser. No. 965,560
Int. Cl.[3] C11D *1/72, 3/075, 3/10, 3/43*
U.S. Cl. 252—139 36 Claims

1. In an alkaline detergent composition in solid form consisting essentially of (by weight):

(i) about 45% to about 80% of a mixture of alkali metal silicate and alkali metal hydroxide, wherein the mixture has a mole ratio of $M_2O:SiO_2$, wherein M is alkali metal, of about 1.25:1 to about 2.25:1;

(ii) about 8% to about 35% of an alkali metal carbonate;

(iii) up to about 40% of an alkali metal condensed phosphate; and

(iv) a nonionic surface active agent which is the condensation product of (A) an aliphatic alcohol with ethylene oxide, propylene oxide or mixtures thereof, or (B) an alkyl phenol with ethylene oxide, and is contained in the composition at about 7% to about 25%, said nonionic surface active agent having a tendency to discolor the composition, the improvement wherein the composition comprises a discoloring inhibiting amount of an alcohol of 3 to 10 carbon atoms having not more than one primary alcohol group and at least one secondary or tertiary alcohol group.

4,320,027

PROCESS FOR PRODUCING HIGHLY STABILIZED BORANE-TETRAHYDROFURAN SOLUTIONS

Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich-Boranes, Inc., Milwaukee, Wis.

Filed May 2, 1980, Ser. No. 146,156
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—188 **5 Claims**

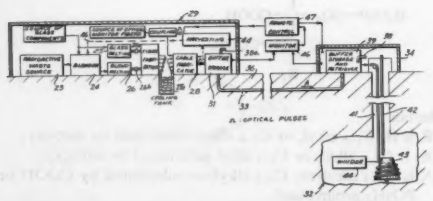
1. The process which comprises heating a stabilized solution of borane in tetrahydrofuran containing an aliphatic, alicyclic or cyclic sulfide in a molar amount above about 50% of the molar amount of borane in the solution and finely divided particles of sodium fluoroborate at a temperature from 35° C. to the reflux temperature of the solution for a period of time sufficient to convert the sodium fluoroborate particles to a form which permits them to be readily removed from the solution such as by settling, filtration or centrifugation.

4,320,028

NUCLEAR WASTE DISPOSAL SYSTEM

H. Richard Leuchtag, 215 Market St., Galveston, Tex. 77550

Filed May 17, 1979, Ser. No. 39,924
Int. Cl.² G21F *9/16*
U.S. Cl. 252—628 **28 Claims**



1. In the method of long-term storage of radioactive waste products wherein said waste products are first made into a vitreous composition containing a suitable content of inert components as diluents and melted, the improvement comprising the steps of:

forming said melted composition into fibers;

forming said fibers into a cable of selected length and having forward and rearward ends, the diameter of said fibers and the number of fibers being such that said cable is sufficiently flexible to be wound onto support means;

providing leader means at said forward end of said cable for feeding said cable to said support means and at said rearward end for retrieving said cable from said support means; and

lowering said cable to a region having sufficient shielding to protect the biosphere,

winding said cable onto said support means in said region and storing said cable on said support means, said method providing for retrieving said cable should said region become unsafe for storage of said cable and for further processing.

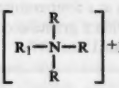
4,320,029

CATALYTIC COMPOSITE, METHOD OF MANUFACTURE, AND PROCESS FOR USE

Robert R. Frame, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 17, 1980, Ser. No. 169,553
Int. Cl.³ B01J *31/22*
U.S. Cl. 252—428 **27 Claims**

1. A catalytic composite comprising a carrier material, a metal chelate oxidation catalyst, a linear organic compound containing from about 9 to about 24 carbon atoms and having an anionic portion, wherein said anionic portion is selected from the group consisting of sulfonate, sulfate and carboxylate and a substituted ammonium compound represented by the structural formula



wherein R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl, R_1 is a substantially straight-chain alkyl radical containing from about 5 to about 20 carbon atoms, and X is an anion selected from the group consisting of halide, nitrate, nitrite, sulfate, phosphate, acetate, citrate, tartrate and hydroxide.

4,320,030

PROCESS FOR MAKING HIGH ACTIVITY TRANSITION METAL CATALYSTS

John Happel, Hastings-on-Hudson, N.Y., and Miguel A. Hnatow, Caldwell, N.J., assignors to Gas Research Institute, Chicago, Ill.

Filed Mar. 21, 1980, Ser. No. 132,536
Int. Cl.³ B01J *21/02, 27/04, 27/24*
U.S. Cl. 252—432 **6 Claims**

1. A process for preparing catalysts of the following empirical atomic formula:

$$X\,Y_xZ_yS_zO_wC_tN_v$$

wherein

X is a transition element or a mixture thereof selected from the group V, Mo, W

Y is a support element or a mixture thereof selected from the group Al, Si, B, Ce, Ti, Zr, where x can vary from 0 to 1

Z is a promoter element or mixture thereof selected from the group Co, Ni, Fe, Mn, where y can vary from 0 to 0.1

S is the element sulfur, where z can vary from 1.3 to 3

O is the element oxygen, where w can vary from 0 to the upper limit required by the stoichiometry

C is the element carbon, where t can vary from 0 to 0.1

N is the element nitrogen, where v can vary from 0 to 0.1,

which consists in preparing a molten solution of a compound of a transition element X in ammonium thiocyanate and/or thiourea in intimate admixture with compounds to supply other elements of the catalyst, heating said mixture in a non-oxidizing atmosphere to a temperature sufficiently high to drive off gases and to produce a solidified mass, calcining said mass in an inert atmosphere at temperatures sufficiently high to remove hydrogen sulfide or sulfur, further heating in a reducing atmosphere to activate the mass to a product catalyst and cooling said product catalyst in a stream of non-reactive gas.

4,320,031

CATALYTIC OXIDATIVE DEHYDROGENATION OF ALKENES OR ALKADIENES TO FURAN COMPOUNDS

R. Parthasarathy, and Eugene V. Hort, both of Wayne, N.J., assignors to GAF Corporation, New York, N.Y.

Filed Sep. 16, 1980, Ser. No. 187,700
Int. Cl.[3] B01J *21/02, 27/14, 23/16, 29/00*
U.S. Cl. 252—432 6 Claims

1. A composition consisting essentially of silver, molybdenum and oxygen, and at least one promotor selected from the group consisting of phosphorus, arsenic, antimony and bismuth, wherein said silver to molybdenum atom ratio is in the range of about 1:1 to about 4:1, and said promotor to molybdenum atom ratio is in the range of about 0.05:1 to 0.1:1.

4,320,032

CATALYST FOR HYDROGENATION OF AROMATIC DINITRILES

Howard P. Angstadt, Media, Pa., assignor to Suntech, Inc., Philadelphia, Pa.

Division of Ser. No. 95,189, Nov. 16, 1979, Pat. No. 4,247,478.
This application Sep. 5, 1980, Ser. No. 184,588
Int. Cl.[3] B01J *21/12, 23/89*
U.S. Cl. 252—455 R 4 Claims

1. A supported catalyst composition comprising cobalt promoted with rhodium wherein the weight ratio of rhodium to cobalt is from 0.1 to 1.0.

4,320,033

SOLID DETERGENT COMPOSITION

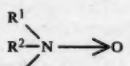
Susumu Yoshikawa, Yokohama, Japan, assignor to Lion Corporation, Tokyo, Japan

Filed Oct. 29, 1980, Ser. No. 201,837
Claims priority, application Japan, Oct. 29, 1979, 54-139477
Int. Cl.[3] C11D *1/75*
U.S. Cl. 252—547 2 Claims

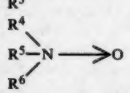
1. A solid detergent composition comprising:

(A) 40 to 89.9% by weight of at least one linear alpha-olefin sulfonate having 12 to 28 carbon atoms,

(B) 10 to 60% by weight of at least one tertiary amine oxide having general formulae (I) and (II)



(I)



(II)

wherein R^1 represents an alkyl group having 16 to 24 carbon atoms, R^2 represents an alkyl group having 1 to 11 carbon atoms, R^3 represents an alkyl group having 1 to 3 carbon atoms, R^4 and R^5 independently represent an alkyl group having 12 to 24 carbon atoms and R^6 represents an alkyl group having 1 to 3 carbon atoms, and

(c) 0.1 to 20% by weight of water.

4,320,034

ELECTRICAL CAPACITOR HAVING AN IMPROVED DIELECTRIC SYSTEM

John Lapp; Marco J. Mason; Gary A. Gauger, all of Franklin, Wis., and Hui-Min Chai, Greenwood, S.C., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Oct. 12, 1979, Ser. No. 84,293
Int. Cl.[3] H01B *3/48*
U.S. Cl. 252—567 13 Claims

1. An electrical capacitor comprising an outer casing, and a capacitor pack disposed in the casing having alternate layers of metal foil and a dielectric material, said dielectric material being impregnated with a dielectric liquid composition which comprises from about 5% to 95% by weight of a diphenyl ethane with at least one of the phenyl groups having a dimethyl substitution, and the balance being propyl diphenyl.

4,320,035

DIELECTRIC GAS-VAPOR AND VAPOR-VAPOR MIXTURES

Ronald T. Harrold, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 4, 1981, Ser. No. 231,520
Int. Cl.[3] H01B *3/20*
U.S. Cl. 252—574 1 Claim

1. A dielectric fluid composition consisting of a gas-vapor mixture of SF_6 gas at 180 Torr, and a vapor mix of from about 10% to 30% CH_2Cl_4 and of from about 70% to 90% C_2Cl_4, both by volume.

4,320,036

LIGNO-NOVOLAK RESIN MOLDING COMPOSITIONS

Riad H. Gobran, New Hope; Akio Takahashi, Solebury, both of Pa., and Eugene P. Reilly, Lawrenceville, N.J., assignors to American Can Company, Greenwich, Conn.

Filed Oct. 16, 1980, Ser. No. 197,479
Int. Cl.[3] C08G *8/28;* C08H *5/02*
U.S. Cl. 524—14 20 Claims

1. A phenolic resin formulation, comprising:

(a) a ligno-novolak blend comprised of a physical admixture of:

(1) about 50 to 95 weight percent of a novolak resin, and

(2) about 50 to 5 weight percent of alkali lignin; and,

(b) a curing agent for said novolak resin and said lignin in an amount sufficient to effect substantial crosslinking thereof.

4,320,037

FOUNDRY BINDERS BASED ON A PHENOLIC REACTION PRODUCT

David Dumolo, Dudley, England, assignor to Fordath Limited, West Bromwich, England

PCT No. PCT/GB78/00049, § 371 Date Aug. 7, 1979, § 102(e) Date Jun. 13, 1979, PCT Pub. No. WO79/00354, PCT Pub. Date Jun. 28, 1979
PCT Filed Dec. 7, 1978, Ser. No. 154,393
Claims priority, application United Kingdom, Dec. 7, 1977, 50880/77
Int. Cl.[3] C08L *91/00, 93/00, 75/04;* C08G *71/04*
U.S. Cl. 523—142 10 Claims

1. In a method of preparing a foundry core or mould wherein there is mixed with a foundry aggregate a polyisocyanate and a polyhydroxy composition, the mixture is formed to the required shape and the polyisocyanate and polyhydroxy composition react together to bind the aggregate, the improvement comprising employing as the polyhydroxy composition a polymeric addition product prepared by reacting a phenol with a substance comprising a carbon-carbon triple bond or at least two carbon-carbon double bonds.

4,320,038

FLAME RETARDANT COMPOSITION BASED ON AN ALKYLENE-ALKYL ACRYLATE COPOLYMER, COATED TALC FILLER AND A NON-POLAR FLAME RETARDANT

Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 33,328, Apr. 25, 1979, Pat. No. 4,255,303, which is a continuation-in-part of Ser. No. 899,563, Apr. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 800,899, May 26, 1977, abandoned. This application Nov. 25, 1980, Ser. No. 210,461

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.[3] C08K *3/16, 9/04*

U.S. Cl. 523—216 14 Claims

1. A composition consisting essentially of a copolymer of an alkylene-alkyl acrylate, at least 10 parts by weight, per 100 parts by weight of said copolymer, of a talc filler coated with a metal salt of a fatty acid having 8 to 20 carbon atoms, wherein the metal is of Group Ia, IIa or IIb of the Mendeleev Periodic Table of Elements and a flame-retardant amount of a non-polar flame retardant.

4,320,039

HEAT-SENSITIVE RECORDING COMPOSITION WITH IMPROVED IMAGE STABILITY

Sadao Morishita, Ibaraki; Fumio Okumura, Kunitachi; Masahiro Higuchi; Masahiro Miyauchi, both of Tokyo, and Syun Kamei, Kitamoto, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Oct. 24, 1980, Ser. No. 200,584

Claims priority, application Japan, Oct. 29, 1979, 54-139494

Int. Cl.[3] C08L *93/00;* C09D *11/00;* G03C *1/52*

U.S. Cl. 525—54.42 3 Claims

1. A heat-sensitive recording composition with an improved image stability which comprises 3-(N-methylcyclohexylamino)-6-methyl-7-anilinofluorane, 4,4'-isopropylidenediphenol capable of color-developing the fluorane through reaction by heating, fatty acid amide as a sensitizer, and water-insoluble modified phenol resin having a softening point of 80° to 190° C, at least 20% by weight of N-monosubstituted fatty acid amide being contained on the basis of total fatty acid amide, and 5 to 50% by weight of the water-insoluble, modified phenol resin being contained on the basis of the 4,4'-isopropylidenediphenol.

4,320,040

METHOD FOR PREPARING HIGHLY ABSORBENT HYDRO-GEL POLYMERS

Fumio Fujita, Takatsuki; Shuji Kitamura, Ibaraki; Toshifumi Tamura, and Tsuneyuki Nagase, both of Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 69,078, Aug. 23, 1979, abandoned. This application Jun. 18, 1980, Ser. No. 160,451

Claims priority, application Japan, Sep. 7, 1978, 53/110451; Sep. 13, 1978, 53/113376

Int. Cl.[3] C08L *29/04, 33/02*

U.S. Cl. 524—459 16 Claims

1. A method for producing a hydrophilic gel comprising polymerizing acrylic acid and/or methacrylic acid in the presence of polyvinyl alcohol to obtain a polymer (A) which is then subjected to neutralization followed by heat treatment or to heat treatment followed by neutralization, or polymerizing a neutralized product of acrylic acid and/or methacrylic acid in the presence of polyvinyl alcohol to obtain a polymer (B) which is then subjected to heat treatment, wherein said polymerization is carried out in an aqueous solution having a total concentration of acrylic acid and/or methacrylic acid or its neutralized product (the weight of the neutralized product is converted to the acid basis) and polyvinyl alcohol of 10 to 60% by weight, said heat treatment temperature is 50° to 150° C., and the weight ratio of polyvinylalcohol to acrylic acid and/or methacrylic acid or its salt (the weight of the neutralized product is converted to the acid basis) is 10 to 90:90 to 10.

4,320,041

AQUEOUS DISPERSION OF OLEFIN RESINS AND CONTINUOUS PROCESS FOR PREPARING THEREOF

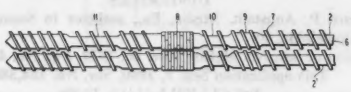
Katsuhiro Abe; Mitsuo Tsuruoka; Shigeki Kiriyama, and Kazunobu Nakamori, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1980, Ser. No. 160,791

Claims priority, application Japan, Jun. 19, 1979, 54/76325

Int. Cl.[3] C08L *29/04*

U.S. Cl. 524—503 20 Claims



1. A process for continuously preparing a homogeneous aqueous dispersion of olefin resin which comprises continuously feeding said olefin resin into a hopper of a multi-screw extruder having at least two screws in the compression zone thereof, continuously feeding an aqueous solution of partially saponified polyvinyl alcohol having from about 65 to 95 mol% of the maximum saponification value under pressure to at least one feed inlet provided in at least one of a compression zone and a metering zone of said extruder which are separate from said hopper, wherein said olefin resin is heated and mixed in said extruder and said aqueous solution is subsequently mixed therewith.

4,320,042

BINDER COMPOSITIONS AND PROCESS FOR PREPARING SAID COMPOSITIONS

Hugh C. Anderson, Barrington; James E. Doyle, Carpentersville, and Russell B. Lembke, Crystal Lake, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Dec. 17, 1980, Ser. No. 217,449

Int. Cl.[3] C08G *8/04;* C08L *61/06*

U.S. Cl. 523—144 6 Claims

6. A process for preparing a binder composition which comprises reacting in furfuryl alcohol under alkaline conditions paraformaldehyde, phenol and the bottoms from distillation of acetone and phenol from the reaction mixture resulting from oxidizing cumene to hydroperoxide, cleaving the hydroperoxide and neutralizing the cleaved products.

4,320,043

FURFURYL ALCOHOL-DIALDEHYDE FOUNDRY BINDERS

Hugh C. Anderson, Barrington, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Jan. 12, 1981, Ser. No. 224,150

Int. Cl.[3] C08G *8/04;* C08L *61/06*

U.S. Cl. 523—144 7 Claims

5. A process for manufacturing foundry sand shapes for use as cores and molds comprising placing a sand mix in a shaping element and hardening the mix in the shaping element, the sand mix comprising sand, an acid catalyst and a binder comprising furfuryl alcohol and an aromatic dialdehyde.

4,320,044

SELF-EXTINGUISHING SILICONE RUBBER CONTAINING ALUMINUM HYDRATE

Akito Nakamura, Ichihara, Japan, assignor to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Oct. 16, 1980, Ser. No. 197,389
Claims priority, application Japan, Dec. 25, 1979, 54/168732
Int. Cl.³ C08K 3/22
U.S. Cl. 524—413 21 Claims

1. A mixture comprising

(A) 100 parts by weight of a polydiorganosiloxane represented by an average unit formula

$$R_aSiO_{4-a/2}$$

wherein each R is selected from a monovalent hydrocarbon radical and a halogen-substituted monovalent hydrocarbon radical, and a has an average value of from 1.98 to 2.05,

(B) 50 to 300 parts by weight of aluminum hydrate with an average particle size of ≦50 μm, and

(C) 0.1 to 30 parts by weight of an oxide selected from the group consisting of gamma-type iron sesquioxide, ferroferric oxide, and mixtures thereof, said oxide being in the form of an extremely fine powder, and said ferroferric oxide having a formula $(FeO)_x(Fe_2O_3)_y$ in which the ratio of x/y is from 0.05/1 to 1.0/1.

4,320,045

POLYESTER-BASED MOLDING COMPOSITIONS

Gwilym Owen, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 104,478, Dec. 17, 1979, abandoned. This application Apr. 10, 1981, Ser. No. 252,747
Int. Cl.³ C08L 67/00
U.S. Cl. 523—523 13 Claims

1. A polymerizable resin-containing system comprising a thermoplastic polymer, a monomer and a polyester, said polyester being the reaction product of an organic acid or anhydride and at least one polyol, or a mixture of polyols, having at least two but not more than four hydroxyl groups, said polyol or said mixture of polyols comprising not less than about 48% of the weight of the reactants forming said polyester, said polyester having a molecular weight to double bond ratio within the range of from about 227 to about 261, said resin-containing system when copolymerized and molded under heat and pressure yielding a cured composition having a surface roughness of from about 110 to about 280 microinches.

12. A method of producing a fibrous reinforced article which comprises incorporating fibrous glass into the system of claim 1 to form a glass-containing composite and molding the composite.

4,320,046

METHOD FOR COLORING OLEFIN POLYMERS

Richard H. Havens, Hockley, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Sep. 15, 1980, Ser. No. 186,983
Int. Cl.³ C08L 23/26, 35/00, 23/24
U.S. Cl. 524—83 8 Claims

1. A method for coloring an ethylene or propylene polymer which consists essentially of:

(a) Dispersing in said olefin polymer an equimolar copolymer of a C-14 or higher alpha-olefin and maleic anhydride, and

(b) Contacting the composition of step (a) with an aqueous solution of a basic dyestuff; the quantity of the alpha-olefin/maleic anhydride copolymer incorporated into the olefin polymer in step (a) being sufficient to produce the desired intensity of color when contacted with the dye solution in step (b).

4,320,047

CURABLE THIXOTROPIC EPOXY/AMINE TERMINATED LIQUID POLYMER COMPOSITIONS

Walter T. Murphy, Cuyahoga Falls, and Clifford D. Guiley, Jr., Medina, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 13, 1980, Ser. No. 206,734
Int. Cl.³ C08K 5/15
U.S. Cl. 523—457 6 Claims

1. A curable thixotropic composition of matter comprising an amine terminated reactive liquid polymer, epoxy resin, sufficient amount of fumed silica to render said composition thixotropic, and a sufficient amount of a mildly alkaline solid substance selected from silicate clays, calcium carbonate, and mixtures thereof, to accelerate gel time thereof.

4,320,048

MELT-BLENDING METHOD OF FORMING PIGMENTED POWDER COATINGS

Charles M. Harmuth, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1980, Ser. No. 164,141
Int. Cl.³ C08J 3/20
U.S. Cl. 523—333 2 Claims

1. An improved method of forming a pigmented powder coating composition, the composition containing at least binder materials and pigment in a pre-determined pigment-to-binder weight ratio and the method being of the kind wherein the constituents are melt-extruded and the extrudate subsequently reduced to a powder, wherein the improvement comprises

(a) introducing a major portion of the non-pigment constituents in substantially dry form into a melt-extruder,

(b) introducing into the melt extruder a pigment dispersion comprising the pigment, the balance of the non-pigment constituents, and at least some, up to 60% by weight, based on the dispersion weight, of a volatile dispersing liquid, the liquid dispersion being introduced at a point downstream of the introduction of the constituents of (a) to mix therewith and being introduced at a rate that will produce an extrudate having the pre-determined pigment-to-binder weight ratio, and

(c) removing the volatile liquid.

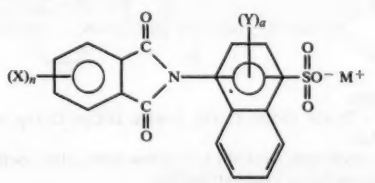
4,320,049

FLAME RETARDING AGENTS FOR POLYCARBONATES

Sivaram Krishnan; Russell P. Carter, Jr., both of New Martinsville, W. Va., and Robert D. Kroshefsky, Aliquippa, Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jul. 14, 1980, Ser. No. 167,971
Int. Cl.³ C07D 209/48; C08K 5/34
U.S. Cl. 524—94 8 Claims

1. The compound



T

wherein X is a halogen,

n is an integer from 1 to 4,

Y is a lower alkyl having 1 to 4 carbon atoms, a halogen or a hydrogen atom,

a is an integer from 0 to 4,

M is an alkali metal, and

T is either 0 or 1.

5. A thermoplastic aromatic polycarbonate comprising a polycarbonate resin and, from 0.01 to 1% by weight, the compound of claim 1 or claim 2.

4,320,050

PROCESS FOR SELECTIVELY EXTRACTING DYESTUFFS CONTAINED IN CYANOPHYCEAE ALGAE, THE SO-EXTRACTED DYESTUFFS AND THEIR USE, PARTICULARLY IN FOODSTUFFS

Michel Rebeller, L'Etang la Ville; Pierre Yout, Vienne, and Daniel Lonchamp, Tassin la Demi-Lune, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 4, 1980, Ser. No. 137,097

Claims priority, application France, Apr. 6, 1979, 79 09120

Int. Cl.³ A23L *1/275*

U.S. Cl. 260—112 R **19 Claims**

1. A process for extracting phycocyanine from Cyanophycae algae, comprising the steps of:

(a) contacting fresh Cyanophycae algae with a first aqueous phase containing calcium ions in an amount of from 0.02 to 0.2 ion-gram per liter, at a temperature, from 15° to 45° C., and under such conditions as to render the phycocyanine in said algae amenable to extraction with an aqueous alkaline solution;

(b) separating resultant mass of algae from said first aqueous phase;

(c) contacting said separated mass of algae with a second aqueous phase of an alkaline character comprising at least one compound selected from the group consisting of alkali metal carbonates, alkali metal bicarbonates, sodium hydroxide and potassium hydroxide, the normality thereof being from 0.001 normal to 0.1 normal, at a temperature from 15° to 45° C., for a sufficient time to transfer the phycocyanine from the algae to the second aqueous phase, and

(d) separating from said second aqueous phase a mass of residual algae, said second aqueous phase containing phycocyanine in a dissolved state.

4,320,051

ANALGESIC TRIPEPTIDE AMIDES

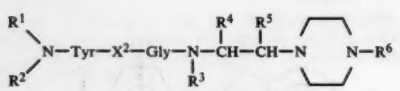
Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 107,292, Dec. 26, 1979, abandoned. This application Aug. 19, 1980, Ser. No. 179,402

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 E **3 Claims**

1. A compound of the formula:



in which

X^2 is D-Ala, D-Ser, D-Thr, D-Met, D-Cys, D-Trp, or D-Asn;

R^1 is hydrogen, alkyl of 1 to 6 carbon atoms, allyl, cyclopropylmethyl or cyclobutylmethyl;

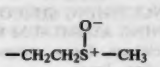
R^2 is hydrogen or alkyl of 1 to 6 carbon atoms;

R^3 is hydrogen or alkyl of 1 to 6 carbon atoms;

R^4 is isobutyl, cyclohexyl, benzyl, p-halobenzyl or p-nitrobenzyl;

R^5 is hydrogen or alkyl of 1 to 6 carbon atoms; and

R^6 is hydrogen, alkyl of 1 to 6 carbon atoms, 2-hydroxyethyl, benzyl, diphenylmethyl, phenyl, p-halophenyl, p-nitrophenyl,



or $-CH_2CH_2SCH_3$;

or a pharmaceutically acceptable salt thereof.

4,320,052

DERIVATIVES OF A-30912A NUCLEUS

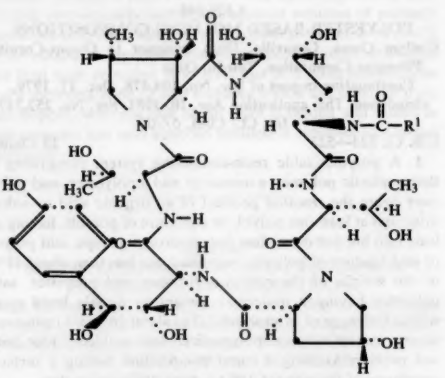
Bernard J. Abbott, Greenwood, and David S. Fukuda, Brownsburg, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 103,030, Dec. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,438

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **25 Claims**

1. A compound of the formula:



wherein R^1 is C_6–C_{24} alkyl or C_6–C_{24} alkenyl, provided that when R^1 is alkyl, R^1 cannot be n-tridecyl n-tetradecyl, n-pentadecyl, or n-heptadecyl; and, when R^1 is alkenyl, R^1 cannot be cis,cis-$CH_3(CH_2)_4CH{=}CHCH_2{-}CH{=}CH(CH_2)_7{-}$.

4,320,053

DERIVATIVES OF A-30912D NUCLEUS

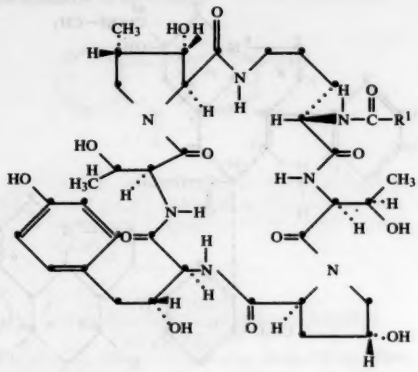
Bernard J. Abbott, Greenwood, and David S. Fukuda, Brownsburg, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 103,315, Dec. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,444

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **28 Claims**

1. A compound of the formula:



wherein R^1 is C_6–C_{24} alkyl or C_6–C_{24} alkenyl, provided that when R^1 is alkyl, R^1 cannot be n-heptadecyl; and, when R^1 is alkenyl, R^1 cannot be cis,cis-$CH_3(CH_2)_4CH{=}CHCH_2{-}CH{=}CH(CH_2)_7{-}$.

4,320,054

DERIVATIVES OF A-30912H NUCLEUS

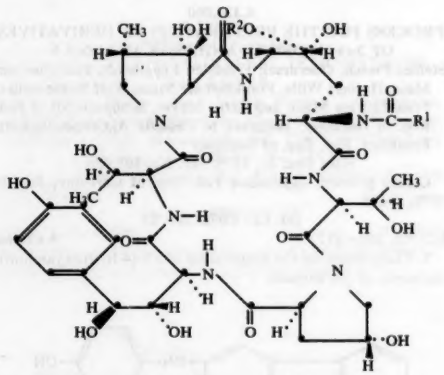
Bernard J. Abbott, Greenwood, and David S. Fukuda, Brownsburg, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 103,316, Dec. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,451

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **28 Claims**

1. A compound of the formula:



wherein R^1 is C_6–C_{24} alkyl or C_6–C_{24} alkenyl and R^2 is C_1–C_6 alkyl, provided that when R^1 is alkyl and R^2 is methyl, R^1 cannot be n-heptadecyl; and, when R^1 is alkenyl and R^2 is methyl, R^1 cannot be cis,-cis—$CH_3(CH_2)_4CH{=}CHCH_2CH{=}CH(CH_2)_7{-}$.

4,320,055

PROCESS FOR PENICILLIN EPIMERIZATION

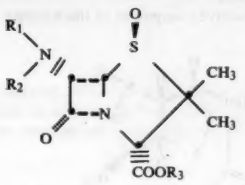
Larry C. Blaszczak, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 7, 1980, Ser. No. 138,022

Int. Cl.³ C07D *499/04*

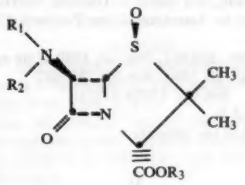
U.S. Cl. 260—239.1 **52 Claims**

1. A process for preparing a compound of the formula I



(I)

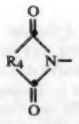
which comprises reacting between about 0.1 to about 4 moles of triethylamine and between about 0.1 to about 4 moles of chlorotrimethylsilane per mole of 6β-acylaminopenicillin-1β-sulfoxide compound of the following formula (II)



(II)

in a substantially anhydrous ether or halogenated hydrocarbon solvent, in which solvent the above 6β-acylaminopenicillin-1β-sulfoxide (II) is present in a concentration of about 0.7 molar or greater, in a substantially anhydrous atmosphere at a temperature between about −20° C. and about 20° C. where in the above formulas

R_1 is hydrogen or an acyl group derived from a carboxylic acid; and R_2 is an acyl group derived from a carboxylic acid; or R_1 and R_2 taken together with the nitrogen atom to which they are attached form a group of the formula



wherein R_4 is the residue of an acyl group derived from a dicarboxylic acid; and R_3 is hydrogen or a conventional carboxylic acid protecting group;

4,320,056

CERTAIN THIA-DIAZATRICYCLO[3,3,3,0^{8,11}]TRIDECANES, AND THEIR PREPARATION

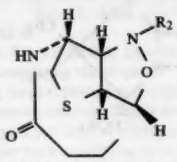
Enrico G. Baggiolini, Bloomfield; Hsi L. Lee, West Paterson, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 150,116, May 15, 1980, Pat. No. 4,284,557, which is a division of Ser. No. 43,282, May 29, 1979, Pat. No. 4,247,704, which is a continuation-in-part of Ser. No. 965,660, Dec. 1, 1978, Pat. No. 4,245,104, which is a continuation-in-part of Ser. No. 822,119, Aug. 5, 1977, Pat. No. 4,130,713. This application Mar. 12, 1981, Ser. No. 243,171

Int. Cl.^{3} C07D *515/18, 515/14*

U.S. Cl. 260—239.3 T **6 Claims**

1. An optically active compound of the formula:



VII

wherein R_2 is benzyl or alpha-lower alkyl benzyl, or the racemate thereof.

4,320,057

ARYL—PYRROLO—THIAZEPIN—DIONES AND ARYL—PIPERIDINO—THIAZEPIN—DIONES

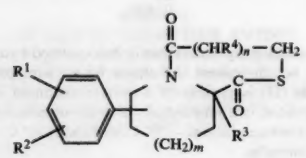
Meier E. Freed, Paoli, and James L. Diebold, Norristown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 161,967, Jun. 23, 1980. This application Mar. 25, 1981, Ser. No. 247,462

Int. Cl.^{3} C07D *513/14*

U.S. Cl. 260—239.3 B **4 Claims**

1. A compound of the formula:



wherein

R^1 and R^2 are independently, hydrogen, alkyl of one to six carbon atoms, alkoxy of one to six carbon atoms or halo;

R^3 is hydrogen or alkyl of one to six carbon atoms;

R^4 is hydrogen or alkyl of one to six carbon atoms;

m is one of the integers 0 or 1; and

n is one of the integers 0, 1 or 2.

4,320,058

20'-HYDROXYVINBLASTINE AND RELATED COMPOUNDS

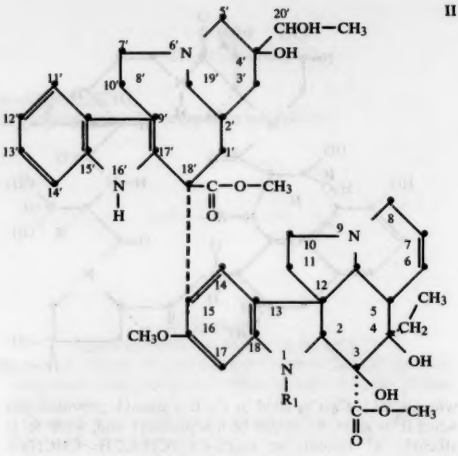
Jean C. Miller, and Gerald L. Thompson, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 29, 1980, Ser. No. 220,471

Int. Cl.^{3} C07D *519/04;* A61K *31/475*

U.S. Cl. 260—244.4 **5 Claims**

1. A compound of the formula:



II

wherein R^1 is CH_3 or CHO, and acid addition salts thereof.

4,320,059

PROCESS FOR THE MANUFACTURE OF PHTHALOCYANINES

Baldomero Casas, White House Station, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 10, 1980, Ser. No. 205,227

Int. Cl.^{3} C07B *47/06*

U.S. Cl. 260—314.5 **6 Claims**

1. In a process for the production of a metal phthalocyanine by fusion of phthalic anhydride or a derivative thereof, urea or a derivative thereof, a metal-yielding compound and a molybdenum catalyst, the improvement which comprises: conducting said reaction in a vigorously agitated reaction vessel under a pressure of about 40 to 200 psig of ammonia gas; said agitation being such that the reactants are at all times in intimate contact and such that said metal phthalocyanine product is obtained as a dry, free-flowing granular powder.

4,320,060

PROCESS FOR THE PREPARATION OF DERIVATIVES OF 3-(4-HYDROXY-ANILINO)CARBAZOLE

Steffen Piesch, Oberursel; Friedrich Engelhardt, Frankfurt am Main; Herbert Wille, Frankfurt am Main; Wolf Weidemüller, Frankfurt am Main, and Artur Meyer, Schöneck, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

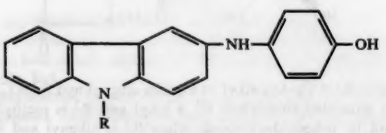
Filed Dec. 31, 1979, Ser. No. 108,486

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1979, 29441

Int. Cl.^{3} C07D *209/88*

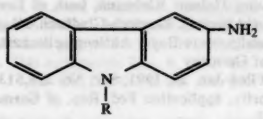
U.S. Cl. 260—317 **8 Claims**

1. The process for the preparation of a 3-(4-hydroxyanilino)-carbazole of the formula



wherein R is hydrogen, alkyl having 1 to 8 carbon atoms or

halogenalkyl having 1 to 8 carbon atoms, comprising reacting a 3-aminocarbazole of the formula.



with p-hydroquinone or p-aminophenol or a mixture of p-hydroquinone and p-aminophenol in at least stoichiometric amounts by heating to a temperature of 150° to 300° C. with exclusion of oxygen.

4,320,061

2,3,4,5-TETRAHYDRO-1-BENZOXEPIN-3,5-DIONE DERIVATIVES

Heinrich-Wilhelm Ohlendorf, Hanover; Klaus-Ullrich Wolf, Haenigsen; Wilhelm Kaupmann, Kirchrode, and Henning Heinemann, Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

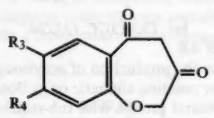
Division of Ser. No. 173,076, Jul. 28, 1980, Pat. No. 4,279,905. This application Mar. 16, 1981, Ser. No. 243,745

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1979, 2931398

Int. Cl.³ C07D *313/08*

U.S. Cl. 260—333 **1 Claim**

1. 2,3,4,5-tetrahydro-1-benzoxepin-3,5-dione derivatives of the following Formula



wherein R_3 and R_4 independently of one another are halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio or one of R_3 and R_4 are halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, trifluoromethyl or nitro and the other is hydrogen, with the proviso that R_3 is not bromine when R_4 is methyl.

4,320,062

PREPARATION OF 5-(2,2,2-TRIHALOETHYL)-DIALKYL-TETRAHYDROFURAN-2-ONES

Rudolf Kropp, Limburgerhof; Martin Fischer, Ludwigshafen, and Klaus Halbritter, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

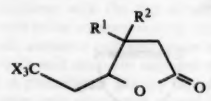
Filed Aug. 14, 1980, Ser. No. 178,171

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1979, 2937836

Int. Cl.³ C07D *307/32*

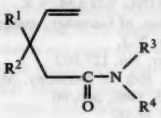
U.S. Cl. 260—343.6 **3 Claims**

1. A process for the preparation of a 5-(2,2,2-trihaloethyl)-4,4-dialkyl-tetrahydro-furan-2-one of the formula I



(I)

where R^1 and R^2 are each alkyl of 1 to 4 carbon atoms and X is halogen, wherein a carboxylic acid amide of the formula II

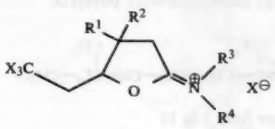


(II)

where R^1 and R^2 are each alkyl of 1 to 4 carbon atoms and R^3 and R^4 are each alkyl of 1 to 4 carbon atoms, aralkyl of 7 to 9 carbon atoms or aryl of 6 to 10 carbon atoms, or together with the nitrogen atom on which they are present as substituents form a 5-membered or 6-membered saturated ring which may contain a second hetero-atom, is reacted with a carbon tetrahalide of the formula III

(III)

where X is halogen, in the presence of an initiator and of an organic diluent or solvent, at from room temperature to 120° C., to give an iminium salt of the formula IV



(IV)

where R^1, R^2, R^3, R^4 and X have the above meanings, and this iminium salt is subsequently hydrolyzed.

4,320,063

AMMONIUM CARBOXYLATES

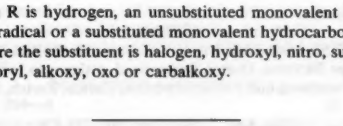
Leonard Kaplan, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 946,314, Sep. 27, 1978, Pat. No. 4,190,598. This application Oct. 16, 1979, Ser. No. 85,208

Int. Cl.³ C07F *9/53*; C07C *147/107, 147/02, 119/00*

U.S. Cl. 260—404.5 **4 Claims**

1. Ammonium carboxylates having the general formula:



wherein R is hydrogen, an unsubstituted monovalent hydrocarbon radical or a substituted monovalent hydrocarbon radical where the substituent is halogen, hydroxyl, nitro, sulfonyl, phosphoryl, alkoxy, oxo or carbalkoxy.

4,320,064

POLYNUCLEAR RHODIUM CARBONYL COMPLEXES

Jose' L. Vidal, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,403

Int. Cl.³ C07F *15/00*

U.S. Cl. 260—429 R **8 Claims**

1. Rhodium carbonyl cluster compounds wherein the cluster comprises twenty-two rhodium atoms.

4,320,065

PROCESS FOR PREPARING VITAMIN K

Karl H. Dötz, Vaterstetten, Fed. Rep. of Germany, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

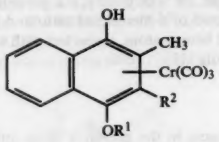
Filed Mar. 4, 1980, Ser. No. 127,002

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1979, 2909091; Switzerland, Jan. 15, 1980, 306/80

Int. Cl.³ C07F *11/00*

U.S. Cl. 260—438.5 R 6 Claims

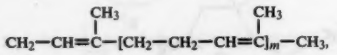
1. A process for the stereospecific preparation of a compound of the formula:



wherein

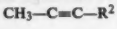
R^1 is lower alkyl, acyl or benzyl;

R^2 is dimethylallyl, geranyl, farnesyl, phytyl or

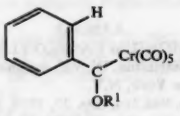


and m is an integer from 3 to 13

comprising reacting an enyne of the formula



with a metal complex of the formula



wherein R^1 is as above.

4,320,066

PROCESS FOR THE PRODUCTION OF COBALTOCEN

Guiseppe Bertossa, Domat, Switzerland, assignor to Inventa AG fur Forschung und Patentve[illegible]rtung Zurich, Zurich, Switzerland

Filed Aug. 7, 1980, Ser. No. 176,176

Claims priority, application Switzerland, Aug. 15, 1979, 7469/79

Int. Cl.³ C07F *15/06*

U.S. Cl. 260—439 CY 16 Claims

1. A process for the production of cobaltocen comprising reacting, in the absence of oxygen and under anhydrous conditions, at least one cobalt alcoholate with cyclopentadiene in the presence of at least one alkaline catalyst taken from the class consisting of alkali metal alcoholates, alkali metal phenolates, alkali metal cyclopentadienates, ammonia, and organic nitrogen bases.

4,320,067

PROCESS FOR THE PREPARATION OF MODIFIED POLYISOCYANATES

Wulf von Bonin; Helmut Kleimann, both of Leverkusen, and Hans-Albrecht Freitag, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 26, 1981, Ser. No. 228,513

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 3003543

Int. Cl.³ C07C *119/042, 119/045, 119/048*

U.S. Cl. 260—453 AR 5 Claims

1. A process for the preparation of modified polyisocyanates in which organic polyisocyanates are reacted with less than a stoichiometric quantity of polyamine, said polyamine being taken from the class consisting of:

(a) a polyamine containing more than three nonaromatically bound, basic nitrogen atoms, of which at least two are primary and/or secondary amino nitrogen atoms, and

(b) a polyamine mixture which contains an average of more than three nonaromatically bound, basic nitrogen atoms, of which at least two are primary and/or secondary amino nitrogen atoms.

4,320,068

PROCESS FOR THE PRODUCTION OF POLYISOCYANATES HAVING A BIURET STRUCTURE

Jurgen Schwindt, Leverkusen; Holger Meyborg, Odenthal; Helmut Reiff, and Klaus Konig, both of, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 12, 1981, Ser. No. 233,736

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007679

Int. Cl.³ C07C *127/24*

U.S. Cl. 260—453 AB 6 Claims

1. A process for the production of polyisocyanates having a biuret structure by reacting aliphatic or cycloaliphatic diisocyanates free from biuret groups with sub-stoichiometric quantities of biuretizing agents, characterized in that compounds containing at least one aldoxime group are used as the biuretizing agent.

4,320,069

OXAZOLINE STABILIZED DIPHENYLMETHANE DIISOCYANATE-POLYMETHYLENE POLYPHENYL ISOCYANATE COMPOSITIONS

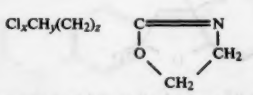
Gary L. Statton, West Chester, and John S. Babiec, Jr., Berwyn, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 20, 1981, Ser. No. 245,867

Int. Cl.³ C07C *119/048*

U.S. Cl. 260—453 SP 6 Claims

1. A method for the storage stabilization of liquid diphenylmethane diisocyanate-polymethylene polyphenyl isocyanate mixtures derived from the thermal decomposition of the corresponding diphenylmethane dicarbamates and polymethylene polyphenyl carbamates prepared by the acid condensation of N-aryl carbamic acid ester with formaldehyde, which comprises incorporating in said liquid isocyanate mixture from about 0.001 to 1.0 percent by weight of a chloroalkyl oxazoline compound having the fomula



wherein x plus y is equal to 3 and z is an integer of from 0 to 3.

4,320,070

PROCESS FOR PREPARING CHLOROTHIOLFORMATES

James A. Cook, Jr., and William A. Keim, both of Barberton, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 78,329, Sep. 24, 1979, abandoned. This application Dec. 8, 1980, Ser. No. 213,511

Int. Cl.[3] C07C *155/02, 154/00*

U.S. Cl. 260—455 A 23 Claims

1. In the process of preparing organic chlorothiolformates by reacting an organic mercaptan having the formula,

R—SH

with phosgene, wherein R is alkyl, cycloalkyl, cycloalkylmethyl, lower alkenyl, aryl, alkaryl, aralkyl, haloaryl, haloaralkyl, and carboalkoxy alkyl, the improvement which comprises conducting said reaction in the presence of a catalytic amount of anion exchange resin, the functional groups of said resin being selected from the group consisting of polyamine and quaternary ammonium functional groups, said resin being present in the neutral salt form.

4,320,071

CONVERSION OF OLEFINIC NITRILES

Filippo Pennella, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 751,741, Aug. 12, 1968, abandoned. This application Aug. 9, 1976, Ser. No. 713,075

Int. Cl.[3] C07C *120/00, 121/30, 121/48, 121/70*

U.S. Cl. 260—464 14 Claims

1. A process for disproportionating propenenitrile with propylene to produce butenenitrile under disproportionation conditions with a catalyst comprising catalyst grade silica promoted with tungsten oxide wherein said disproportionation conditions include a temperature in the range of about 400° to 1100° F.

4,320,072

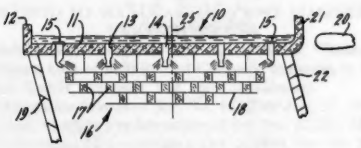
COOLING TOWER SPRAY NOZZLE

William A. Arndt, Healdsburg, Calif., assignor to Ecodyne Corporation, Chicago, Ill.

Filed Feb. 27, 1981, Ser. No. 239,096

Int. Cl.[3] B05B *1/26*

U.S. Cl. 261—111 12 Claims



1. A liquid cooling tower comprising;

A. means defining a liquid cooling chamber having an air entrance end and an air exit end, splash fill member supported within said cooling chamber;

B. means for causing air to flow through said cooling chamber;

C. a hot liquid basin above said cooling chamber, there being a plurality of liquid distribution holes in said basin communicating with the top of said cooling chamber, some of said holes communicating with said chamber adjacent said air entrance end and some of said holes communicating with said chamber adjacent said air exit end;

D. a plurality of gravity liquid spray nozzles having their inlet ends connected to said holes, said nozzles dispersing said hot liquid over said fill members where said hot liquid is cooled by said air flowing through said cooling chamber; and

E. means for preventing escape of liquid from said cooling chamber comprising some of said nozzles that communicate with said holes adjacent said entrance and exit ends being restricted nozzles that spray said liquid in a pattern that is not more than about 180° in a horizontal plane, and such liquid spray pattern being directed toward the central plane of said chamber, whereby said liquid is prevented from being sprayed beyond said entrance and exit ends of said cooling chamber.

4,320,073

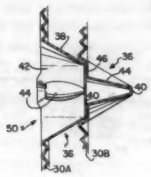
FILM FILL SHEETS FOR WATER COOLING TOWER HAVING INTEGRAL SPACER STRUCTURE

Thomas W. Bugler, III, Prairie Village, Kans.; Donald J. Lillig, Grandview, Mo.; Thomas L. Brown, Shawnee Mission, and Ohler L. Kinney, Jr., Leawood, both of Kans., assignors to The Marley Company, Mission, Kans.

Filed Nov. 14, 1980, Ser. No. 206,872

Int. Cl.[3] B01F *3/04*

U.S. Cl. 261—112 12 Claims



9. A fill member, comprising:

a thin, integral sheet of material configured to present a plurality of spaced, outwardly extending, elongated indexing units thereon,

said units each including a pair of spaced, closely adjacent, outwardly extending wall segments,

said wall segments being in the form of opposed end walls, there being a pair of opposed, recess-defining walls between said end walls and an elongated top wall joining said end walls,

each of said recess-defining walls including an inwardly extending, shoulder-defining bottom wall, the bottom walls being spaced apart a distance for engaging the ends of a top wall of another of said units on an adjacent fill member.

4,320,074

PROCESS FOR PREPARING SHAPED BODY OF ALUMINA

James D. Birchall, and Michael J. Morton, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 337,847, Mar. 5, 1973, abandoned. This application May 18, 1979, Ser. No. 40,314

Claims priority, application United Kingdom, Mar. 15, 1972, 12088/72

Int. Cl.[3] B29C *6/00;* C04B *35/02*

U.S. Cl. 264—8 28 Claims

1. A process for the preparation of a shaped body having at least one dimension less than 100 microns and comprising alumina in either noncrystalline form or in predominantly eta form or both and free of alpha-alumina which includes the steps of:

(a) forming into the desired shape of body a composition having a viscosity in the range 0.1 to 5000 poise and comprising a water-soluble aluminum compound decomposable to alumina and selected from the group consisting of the chlorides, sulphates, acetates, formates, propionates, oxalates, phosphates and nitrates of aluminum or mixtures thereof, a water soluble organic polymer having a molecu-

lar weight in the range 10^3 to 10^7 and present in an amount by weight less than the aluminum compound, and water;

(b) removing at least part of the water from the body so formed;

(c) subjecting the body to hydrothermal treatment at a temperature of from 200°–800° C. for 2 minutes to 5 hours to decompose at least partially the aluminum compound to alumina or an alumina hydrate; and

(d) calcining the hydrothermally treated body at a temperature of from 600° to 1000° C. for a period of one minute to one hour so as to obtain the alumina in either noncrystalline form or in predominantly eta crystalline form or both and free of alpha-alumina.

4,320,075

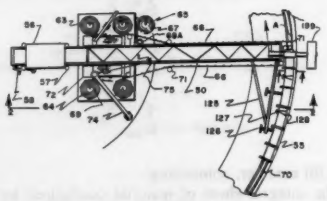
SELF-PROPELLED SLIP FORM METHOD

Jay P. Nielson, 3490 Monte Verde Dr., Salt Lake City, Utah 84109

Division of Ser. No. 855,167, Nov. 28, 1977, Pat. No. 4,193,750. This application Oct. 9, 1979, Ser. No. 82,973

Int. Cl.³ E04B *2/84*

U.S. Cl. 264—32 **13 Claims**



1. A method of casting and forming concrete spirally in a continuous band, comprising feeding concrete mix into a slip form which is closed at its front, top, and sides but is open at its rear and bottom; and applying pressure to the said closed front of the slip form through the intermediacy of the fed concrete, so as to advance the slip form spirally solely by reason of said pressure, while constraining said slip form to rotate about a fixed center.

4,320,076

EXPANDABLE SEALING COMPOSITIONS

Terence L. Greenwood, Geneva, Switzerland, assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 917,879, Jun. 22, 1978, abandoned. This application Apr. 8, 1981, Ser. No. 252,270

Int. Cl.³ E04B *1/16;* **C08J** *9/00*

U.S. Cl. 264—35 **5 Claims**

1. A process of caulking or sealing a cavity which comprises inserting into said cavity a composition comprising a butyl rubber containing about 1½ to 4½ percent isoprene and from about 5 to 25 percent by volume of expandable resinous microspheres containing a volatile blowing agent inside said resinous microspheres and heating said butyl rubber composition to expand same to fill the cavity.

4,320,077

METHOD AND APPARATUS FOR HEATING LENGTHS OF THERMOPLASTIC MATERIAL

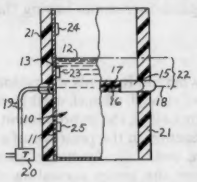
Thomas F. Moran, 540 Cobblestone, Aurora, Ohio 44202

Filed Dec. 8, 1980, Ser. No. 213,853

Int. Cl.³ B29C *17/02*

U.S. Cl. 264—40.6 **11 Claims**

1. A method of heating and bending lengths of thermoplastic material by heating central sections of said lengths without substantially heating end sections of said lengths, comprising the steps of at least partially filling a container to a first level with a fluid medium having a boiling point substantially higher than the softening point of the thermoplastic material, said medium being chemically inert with respect to the thermoplastic material and once heated retaining its heat for the period of time necessary to adequately heat the thermoplastic material, attaching an annular heat band to the container at a second level below said first level, enclosing at least a portion of said container in a thermally insulating material, applying heat to said container at said second level by activating said heating



band, forming a stratum of heating fluid medium between said first level and said second level, inserting said length of thermoplastic material into said container from the top when said stratum of heated medium reaches a desired temperature until a section of said length to be heated is located substantially in said stratum with one end section of said length above said medium and the other end section in the medium below said stratum, withdrawing said length when it has been heated sufficiently and then promptly bending said length.

4,320,078

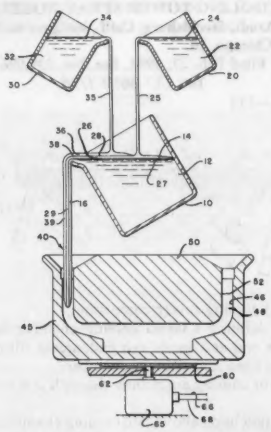
PROCESS FOR MAKING MARBLEIZED GYPSUM POTTERY

Harvey D. Allen, and Monte D. Allen, both of Rte. 1, Box 17, Comanche, Tex. 76442

Filed Feb. 13, 1978, Ser. No. 877,203

Int. Cl.³ C04B *33/28*

U.S. Cl. 264—73 **3 Claims**



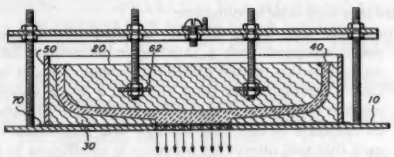
1. A process for making a hard, durable, porous, article of gypsum cement having a varigated or marbelized appearance comprising the steps of: forming a first batch of gypsum material by mixing 30 parts water with 100 parts gypsum cement reinforced with fiberglass fibers; forming a second colored batch of gypsum material by mixing 25 parts water with 100 parts concentrated mortar color; pouring material from the second colored batch of gypsum material onto the surface of the first batch of gypsum material such that an interface is formed between the first and second batches of gypsum mate-

rial; pouring the first and second batches of gypsum material into an impervious mold such that the gypsum material of the first batch and the colored gypsum material of the second batch forms a casting of gypsum cement having discrete markings of different colors; partially curing the casting in the impervious mold at a first controlled temperature range between sixty-eight degrees and seventy degrees Fahrenheit; removing the casting from the impervious mold; and completing curing the casting out of the mold at a second controlled temperature range between 114 degrees and 126 degrees Fahrenheit.

4,320,079
METHOD FOR MAKING SHAPED CARBON FIBER STRUCTURES

William P. Minnear, Schenectady, and William A. Morrison, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 9, 1980, Ser. No. 138,538
Int. Cl.³ B29G *7/00*; B29C *5/00*; C04B *35/70*
U.S. Cl. 264—102 **4 Claims**



1. A method for making shaped carbon fiber structures which comprises
(1) blending carbon fiber and curable binder to produce a stable pourable suspension,
(2) degassing the suspension of (1) by use of reduced pressure,
(3) pouring the degassed suspension into a mold,
(4) stripping the suspension in the mold of excess binder, and
(5) allowing or effecting the cure of the residual binder to produce a self-supporting shaped carbon fiber structure.

4,320,080
METHOD TO MANUFACTURE SOFT MAGNETIC PRESSED BODIES

Friedrich Esper, Leonberg, and Hans-Martin Wiedenmann, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 163,730, Jun. 27, 1980, abandoned, which is a continuation of Ser. No. 22,282, Mar. 20, 1979, abandoned. This application Oct. 3, 1980, Ser. No. 193,467
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1978, 2812445
Int. Cl.³ B22F *3/02*
U.S. Cl. 264—111 **16 Claims**

1. Method to manufacture soft magnetic pressed bodies comprising a mixture of soft magnetic material and a resin binder,
comprising the steps of
preparing a mixture of iron powder which includes atomized, sponge or electrolytic iron powder and a liquid component consisting essentially of a liquid thermosetting resin having a viscosity of at least 1,000 cpoises;
filling the mixture into a die;
heating said die;
building up pressure in said die to squeeze out excess liquid and permit escape thereof through the clearance between die walls and adjacent punch side walls during build-up of the pressure;
and keeping the pressure for final compacting until the resin has cured.

4,320,081
PROCESS FOR THE MANUFACTURE OF FIBRES FROM POLY-P-PHENYLENE TEREPHTHALAMIDE

Henri T. Lammers, Duiven, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

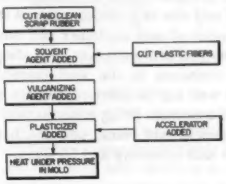
Filed Jun. 2, 1980, Ser. No. 155,595
Claims priority, application Netherlands, Jun. 8, 1979, 7904495
Int. Cl.³ D01F *6/00*
U.S. Cl. 264—184 **14 Claims**

1. A process for the manufacture of fibers from a polyamide consisting essentially of poly-p-phenylene terephthalamide, by spinning a spinning mass having a temperature of 20°–120° C. and consisting essentially of a mixture of concentrated sulphuric acid having a strength of at least 96% by weight and, calculated on the weight of the mixture, at least 15% of polyamide having an inherent viscosity of at least 2.5, the spinning mass being downwardly extruded into a coagulation bath from a spinneret whose efflux side is positioned in a gaseous inert medium and shortly above the liquid surface of the coagulation bath, characterized in that the spinning mass is prepared by the successive steps of cooling the concentrated sulphuric acid to below its solidifying point, combining the sulphuric acid thus cooled and the polyamide and intermixing the two substances into a solid state mixture, and heating the resulting solid state mixture to spinning temperature.

4,320,082
MOLDING OF ROTARY MOWER SAFETY BLADE

Elmer R. Houle, 2221 N. 40th St., Phoenix, Ariz. 85008

Continuation-in-part of Ser. No. 894,495, Apr. 7, 1978, abandoned, which is a division of Ser. No. 832,201, Sep. 12, 1977, abandoned. This application Aug. 13, 1979, Ser. No. 66,090
Int. Cl.³ B29C *6/02*
U.S. Cl. 264—257 **10 Claims**



1. The method of manufacture of a safety blade for rotary mowers, said blade have a central section and end portions, the end portions each having a cutting edge, said method comprising the steps of:
mixing comminuted elastomeric material with fibers of an organic polymer with the fibers constituting from 45–60% by weight of the mixture of comminuted elastomeric material and fiber so that the fibers are substantially uniformly distributed and randomly oriented throughout the mixture and a solvent;
adding a vulcanizing agent to the mixture;
adding a plasticizer and reaction accelerator to the mixture and mixing them together;
placing a first layer of the mixture into the mold;
placing a layer of a fabric made of high tensile strength organic material over the first layer;
placing a second layer of the mixture over the layer of fabric;
placing a metal bar in the mold so that the bar will be symmetrically disposed with respect to the central section of the blade;
filling the mold with the mixture; and
applying heat and pressure to the contents of the mold to

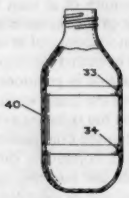
form a blade, the fabric being positioned in the blade so that it substantially intersects the cutting edges of the blade.

4,320,083

PROCESS OF PREPARING REINFORCED CONTAINER

Kjell M. Jakobsen, Skanör, Sweden, assignor to Platmanufaktur AB, Malmo, Sweden

Division of Ser. No. 18,190, Mar. 7, 1979. This application Jul. 10, 1980, Ser. No. 168,206
Claims priority, application Sweden, Mar. 13, 1978, 7802815
Int. Cl.[3] B29D *23/03*
U.S. Cl. 264—531 10 Claims



1. A process for the manufacture of a container of thermoplastic material comprising rapidly cooling a blank produced by extrusion or injection molding to form an amorphous structure, and reheating the blank while blowing the blank to effect biaxial stretching, said blank being subjected before said blowing to localized treatment in a zone to modify the structure of the material and produce subsequent reinforcing ribs on the container, the modification of the structure in said zone leading in the subsequent blowing and biaxial stretching operation to a lesser degree of expansion of the material in said zone and the formation of said ribs of a denser material structure in relation to the remainder of said container and wherein said ribs are formed as humped protuberances providing increasing thickness of the container in the wall thereof at said ribs and wherein said wall has an outer continuous surface at said ribs, said localized treatment being a mechanical treatment to form annular recesses in said blank, said ribs being formed at said recesses after said reheating and blowing.

4,320,084

AIR CONDUITS AND PROCESS THEREFOR

Claude F. Elgner, Toronto, Canada, assignor to Salga Associates Limited & Company, Southfield, Mich.

Continuation-in-part of Ser. No. 575,587, May 8, 1975, abandoned. This application Dec. 20, 1976, Ser. No. 752,109
Claims priority, application Canada, Jun. 9, 1976, 254389
Int. Cl.[3] B29C *17/07*
U.S. Cl. 264—540 5 Claims

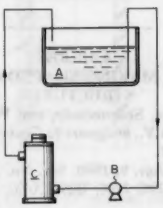
1. In a process for the manufacture of an air duct for transporting hot and cold air from a source thereof, the improvement which comprises: molding a composition comprising (a) polypropylene and (b) a polystyrene-polyolefin block copolymer, the copolymer consisting essentially of polystyrene end blocks and an ethylene-butylene copolymer rubbery midblock, and in which the poly-propylene is present in the composition in an amount ranging from about ten to about fifty percent by weight, based on the total weight and the block copolymer is present in an amount ranging from about fifty to about ninety percent by weight, based on the total weight.

4,320,085

METHOD OF INHIBITING AND ELIMINATING CHLOROPHYCEAE IN WATER IN TANK

Masanobu Takeguchi, and Isao Oyobe, both of Fujisawa, Japan, assignors to Marui Industry Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1980, Ser. No. 137,270
Claims priority, application Japan, Apr. 10, 1979, 54-42472
Int. Cl.[3] A61L *2/10*
U.S. Cl. 422—24 3 Claims



1. A method of inhibiting and eliminating chlorophyceae in water in a tank which comprises:

circulating said water through an ultraviolet irradiation vessel equipped with a short-wave ultraviolet lamp at such a rate that at least half of the volume of water in said tank is circulated per hour and that a given volume of water is exposed to at least 170 μW.min/cm^2 of ultra-violet radiation at one pass through said irradiation vessel such that said ultraviolet exposure is insufficient to kill a substantial portion of said chlorophyceae in said one pass and without having a detrimental affect on higher aquatic life forms;

exposing said water to a chlorophyceae inhibiting and eliminating agent consisting essentially of ultraviolet radiation, having a predominant wavelength of 253.7 nm, and

returning said water to said water tank.

4,320,086

PAPER DEVICE FOR RAPID DETECTION OF COCAINE

Andre Reiss, 147 - 47 Village Rd., Jamaica, N.Y. 11435

Filed Jan. 5, 1981, Ser. No. 222,636
Int. Cl.[3] G01N *31/22, 33/52*
U.S. Cl. 422—56 5 Claims

1. A test device for the colorimetric determination of cocaine or its compounds, said device comprising a bibulous carrier incorporating a dry residue of a solution comprising cobalt thiocyanate and phosphotungstic acid.

4,320,087

LABORATORY ASSAY DEVICE

Kue H. Chau, Mundelein, Ill., and Robert A. Beard, Kenosha, Wis., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jan. 23, 1978, Ser. No. 871,268
Int. Cl.[3] G01N *33/54, 33/56*
U.S. Cl. 422—69 2 Claims

1. A device useful for conducting immunologic and biochemical assays which comprises:

(a) a reaction vial having an opening for the introduction and removal of reagents;

(b) an adsorbent solid phase freely movable within said vial; and

(c) means integral with said vial and positioned proximal to

said opening to retain and prohibit removal of said adsorbent solid phase but permitting removal of nonadsorbed

reagents wherein the adsorbent solid phase is a support coated with activated charcoal.

4,320,088

PROCESS AND APPARATUS FOR WIDENING THE POLYETHYLENE MOLECULAR WEIGHT DISTRIBUTION BY USING TWO REACTORS AND TWO SEPARATORS

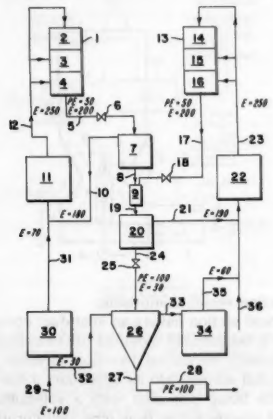
Adrien Nicco, Bethune, France, assignor to Societe Chimique des Charbonnages-CDF Chimie, Paris, France

Division of Ser. No. 108,235, Dec. 28, 1979, Pat. No. 4,269,948. This application Dec. 2, 1980, Ser. No. 212,234

Claims priority, application France, Dec. 28, 1978, 78 36625

Int. Cl.³ C08F *2/02, 10/02;* **B01J** *12/02*

U.S. Cl. 422—134 **2 Claims**



1. Apparatus for carrying out the polymerization of ethylene comprising

(a) means defining a first reactor;

(b) means defining a first separator;

(c) means defining an expansion valve located at the outlet of the first reactor and connected to the first separator;

(d) means defining a mixer connected to the base of the first separator;

(e) means defining a first hypercompressor of which the intake is connected to the outlet of the first separator and of which the outlet is connected to the first reactor;

(f) means defining a second reactor;

(g) means defining an expansion valve located at the outlet of the second reactor and connected to the mixer;

(h) means defining a second separator connected to the outlet of the mixer;

(i) means defining a second hypercompressor of which the intake is connected to the outlet of the second separator and of which the outlet is connected to the second reactor;

(j) means defining a degassing hopper;

(k) means defining an expansion valve located at the base of the second separator and connected to the hopper;

(l) means defining a compressor of which the intake is connected to the top of the hopper and of which the outlet is connected to the intake of the second hypercompressor;

(m) means defining a source of hydrogen connected to one intake of the second hypercompressor; and

(n) means defining a source of ethylene connected to an intake of the first hypercompressor.

4,320,089

BOTTOM SCREEN FOR FLUIDIZED BED APPARATUS

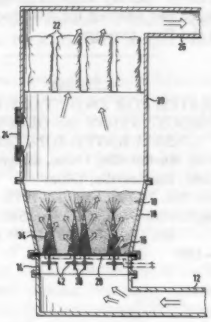
Herbert Hüttlin, Lörracher Strasse 14, 7853 Steinen, Fed. Rep. of Germany

Filed Mar. 19, 1980, Ser. No. 131,565

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912780

Int. Cl.³ B01J *8/36, 8/44*

U.S. Cl. 422—140 **9 Claims**



1. A fluidized bed apparatus comprising

a substantially planar bottom plate having apertures and provided with a plurality of openings therethrough,

and a plurality of perforated cones secured side by side with each said cone above one of said openings in said bottom plate, the height of said cones being from two to three times their base diameter.

4,320,090

APPARATUS FOR PRODUCING A HIGH DPG CARBON BLACK

Harold R. Hunt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 853,716, Nov. 21, 1977, abandoned. This application Feb. 5, 1980, Ser. No. 118,720

Int. Cl.³ C09C *1/48, 1/68*

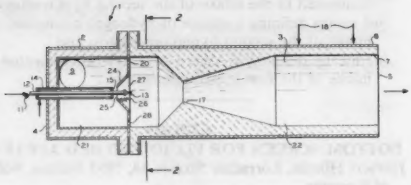
U.S. Cl. 422—150 **9 Claims**

1. An apparatus comprising:

(a) a housing having an interior surface defining an elongate flow passage with an upstream end and a downstream end with a tangentially directed inlet adjacent the upstream end and an outlet adjacent the downstream end;

(b) a partition positioned in said flow passage between the inlet and outlet and extending across the flow passage generally transversely to the longitudinal axis of the flow passage, said partition having an annular peripheral portion and a centrally positioned tubular portion with the tubular portion having an open inlet end and an open outlet end and positioned generally coaxially with the

flow passage and extending generally upstream from said annular peripheral portion thereby forming a flow path between the upstream side and the downstream side of the partition, an interior surface of the tubular portion diverging in a downstream direction and forming an angle A of between about 30° and about 75° with a plane defined by a downstream surface of said annular peripheral portion, said partition also having at least one through aperture in



said annular peripheral portion communicating between the upstream and downstream sides and being positioned between the tubular portion and said interior surface of the housing; and

(c) a tubular member extending into the flow path and having a discharge opening directed generally axially into the flow passage and adapted for introducing a carbonaceous feed into the flow passage.

4,320,091

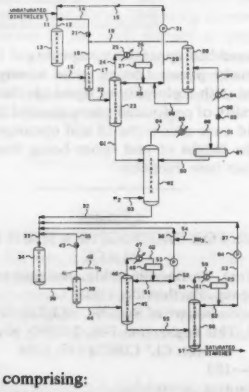
APPARATUS FOR TWO STAGE CATALYTIC HYDROGENATION OF OLEFINICALLY UNSATURATED DINITRILES

Howard B. Irvin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 74,708, Sep. 12, 1979, Pat. No. 4,263,228. This application Nov. 26, 1980, Ser. No. 210,503

Int. Cl.³ B01J *8/02, 19/24*

U.S. Cl. 422—190 **7 Claims**



1. Apparatus comprising:

a first reactor means;

means for introducing an olefinically unsaturated dinitrile feedstock into said first reactor means, said introducing means including a source means for said feedstock;

means for introducing a first diluent into said first reactor means, said introducing means including a source means for said diluent;

means for introducing hydrogen into said first reactor means, said introducing means including a source means for said hydrogen;

a fractionation column means;

means for withdrawing the reaction effluent from a lower portion of said first reactor means and for introducing said reaction effluent into said fractionation column means;

means for withdrawing at least a portion of said first diluent as an overhead product from said fractionation column means;

a stripping column means;

means for withdrawing a first intermediate dinitrile product containing a reduced concentration of said first diluent as a bottom product from said first fractionation column means and for supplying said first intermediate dinitrile product to said stripping column means;

means for supplying hydrogen to said stripping column means, said supplying means including a source means for said hydrogen;

means for withdrawing the hydrogen supplied to said stripping column means and at least a portion of said first diluent remaining in said first intermediate dinitrile product from said stripping column means as an overhead product from said stripping column means;

a second reactor means; and

means for removing a second intermediate dinitrile product having a substantially reduced concentration, if any, of said first diluent as a bottoms product from said stripping column means and for supplying said second intermediate dinitrile product to said second reactor means.

4,320,092

REACTION VESSEL

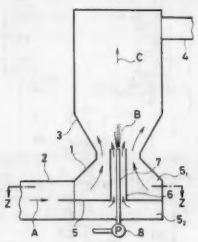
Jyunichi Kondo; Akira Sensyu; Hidetaka Ono, and Hiroki Honda, all of Yokohama, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1980, Ser. No. 178,273

Claims priority, application Japan, Aug. 24, 1979, 54-107100

Int. Cl.³ B01F *3/04*

U.S. Cl. 422—224 **2 Claims**



1. A reaction vessel, comprising:

a cylindrical section having an inlet duct connected thereto which is tangentially mounted to the cylindrical section;

a substantially horizontal partition member dividing said cylindrical section into an upper and a lower space, said partition being provided with a substantially centrally located upright piston flow pipe, said upright piston flow pipe having an upper end;

an injection pipe provided with an open end, said injection pipe being mounted within at least a portion of said upright piston flow pipe and said open end of said injection pipe positioned in the proximity of the upper opening of said upright piston flow pipe, said open end of said injection pipe directing flow in the direction of said piston flow;

a conical section formed above the upper space of said cylindrical section with a decreasing diameter proceeding in the upward direction; and

a second conical section mounted above said first conical section, said second conical section having increasing diameter towards an outlet duct whereby a fluid entering said inlet duct is divided by said horizontal partition into

two streams whereby the stream passing through said upper space is caused to form a spiral flow and the stream passing through said lower space forms a piston flow through said piston flow pipe.

4,320,093

SEPARATION OF URANIUM BY BIOSORPTION

Bohumil Volesky, 471 Berkley Ave., St. Lambert, Quebec, Canada (J4P 3E7), and Marios Tsezos, 670 de Gaspe, Apt. 411, Montreal, Quebec, Canada

Filed Nov. 13, 1979, Ser. No. 93,406
Int. Cl.[3] C01G *43/00*
U.S. Cl. 423—6 5 Claims

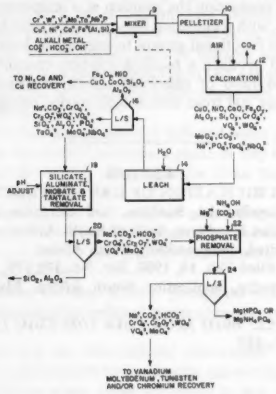
1. A process for the extraction of uranium- and/or thorium-containing cations from aqueous suspension or solution, which comprises contacting an aqueous solution or suspension containing at least one of said cations with an effective amount of a biomass effective to absorb large quantities of at least one of said cations, said biomass being derived from the growth of a Rhizopus fungal microorganism.

4,320,094

PARTITIONING OF REFRACTORY METALS FROM OXIDATION RESISTANT SCRAP ALLOY

Jameel Menashi, Lexington; Alkis S. Rappas, Bedford, both of Mass., and Donald A. Douglas, Amherst, N.H., assignors to Cabot Corporation, Kokomo, Ind.

Filed Apr. 15, 1980, Ser. No. 140,428
Int. Cl.[3] C01G *37/00, 39/00, 41/00*
U.S. Cl. 423—56 71 Claims



1. A process for partitioning a refractory metal selected from the group consisting of Cr°, W°, Mo° and mixtures thereof from an oxidation and corrosion resistant alloy selected from the group consisting of nickel base, cobalt base and iron base alloys, said process comprising the steps of:

A. providing a feed material comprising said oxidation and corrosion resistant alloy, at least about 50% by weight of said alloy being particles having a nominal particle size no greater than about 500 microns, said refractory metal and said base metal being present in metallic form;

B. calcining said feed material at a temperature greater than about 850° C. in the presence of an oxygen containing gas and an alkali metal salt having a carbonate, bicarbonate, or hydroxide anion to form a water soluble salt selected from the group consisting of alkali chromates, alkali molybdates, alkali tungstates and mixtures thereof and water insoluble oxides selected from the group consisting of nickel oxide, cobalt oxide, iron oxide and mixtures thereof;

C. water leaching the mixture resulting in step B to dissolve the water soluble salts to produce a water insoluble leach residue and a pregnant leach solution containing a refractory metal ion, said leach solution being substantially free of Fe, Co, and Ni values; and

D. separating the pregnant leach solution from said water insoluble residue.

4,320,095

AUTOCLAVE SODA DIGESTION OF REFRACTORY SCHEELITE CONCENTRATES

Paul B. Queneau; Dale K. Huggins, both of Golden, and Leo W. Beckstead, Arvada, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Jan. 19, 1981, Ser. No. 225,913
Int. Cl.[3] C01G *41/00*
U.S. Cl. 423—61 22 Claims

1. In a process for the soda ash digestion of tungsten concentrates wherein a slurry is formed of a concentrate with an aqueous carbonate solution and the slurry digested at a selected elevated temperature, the improvement which comprises:

forming a slurry of the concentrate with an aqueous solution of sodium carbonate, the amount of sodium carbonate being a fractional portion of an amount predetermined to effect substantially complete dissolution of the tungsten as WO_3 equivalent in said concentrate at the temperature selected for said digestion,

said predetermined amount of sodium carbonate being such that the Na_2CO_3/WO_3 weight ratio ranges from about 0.9 to 2,

digesting said concentrate with said solution containing said fractional portion of sodium carbonate at a selected temperature in the range of about 180° C. to 310° C.,

and then, while said slurry is being digested at said selected temperature, adding the remaining fractional portion of said sodium carbonate in at least one stage-wise addition to control the concentration thereof in said solution during digestion and effect substantially complete dissolution of said WO_3 in said concentrate while inhibiting substantial dissolution of gangue minerals,

the total amount of said predetermined sodium carbonate following said at least one stage-wise addition being such as to provide a concentration corresponding to an all-at-once addition of sodium carbonate of initial concentration ranging from about 50 gpl to 200 gpl over said Na_2CO_3/WO_3 weight ratio of 0.9 to 2, with the concentration of Na_2CO_3 substantially inversely correlated to the digestion temperature and substantially directly correlated to the Na_2CO_3/WO_3 weight ratio,

whereby at least about 97% of the WO_3 equivalent in said concentrate is dissolved to provide a pregnant solution thereof at the desired concentration.

4,320,096

COMBINED AUTOCLAVE SODA DIGESTION OF WOLFRAMITE AND SCHEELITE

Paul B. Queneau; Dale K. Huggins, both of Golden, and Leo W. Beckstead, Arvada, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Jan. 19, 1981, Ser. No. 225,905
Int. Cl.[3] C01G *41/00*
U.S. Cl. 423—61 19 Claims

1. A process for the soda digestion of a mixture of wolframite and scheelite concentrates which comprises:

forming a slurry of a combined mixture of a wolframite and scheelite concentrate in an aqueous sodium carbonate solution of a concentration ranging from about 50 gpl to 200 gpl at a Na_2CO_3/WO_3 weight ratio of about 0.9 to 2,

digesting said slurry in an autoclave at a temperature ranging from about 180° C. to 310° C.,

the concentration of the Na_2CO_3 solution being substantially inversely correlated to the digestion temperature

and substantially directly correlated to the Na_2CO_3/WO_3 weight ratio,

and while digesting said slurry, adding an amount of sodium hydroxide calculated at least stoichiometrically to react with $NaHCO_3$ formed as a result of the hydrolysis of $FeCO_3$ produced during the digestion of said wolframite and convert it to Na_2CO_3, the amount of NaOH added replacing a part of the sodium carbonate within the range of the Na_2CO_3/WO_3 weight ratio of about 0.9 to 2,

such as to effect dissolution of over about 95% of the WO_3 in the mixed concentrate and provide a pregnant liquor containing substantially all of said WO_3.

4,320,097

RECOVERY OF VANADIUM FROM ACIDIC SOLUTIONS THEREOF

Richard A. Brown, Trenton, N.J.; Myles Fixman, and Dale L. Lesher, both of Canon City, Colo., assignors to FMC Corporation, Philadelphia, Pa.

Filed Sep. 29, 1980, Ser. No. 192,131
Int. Cl.³ C01G *31/00*
U.S. Cl. 423—63 6 Claims

1. The process for the oxidation of vanadium in aqueous sulfuric acid leach liquors comprising treating the solution with hydrogen peroxide in the presence of an effective amount of iron ions in the range of about 0.1 to about 20 g/l, the hydrogen peroxide at a given time being maintained at a level not substantially exceeding the rate at which it is being consummed in the oxidation of the vanadium.

4,320,098

ALUMINUM SULFATE MANUFACTURE FROM ALUMINUM DROSS TAILINGS

Durward A. Huckabay, Reno, Nev., and Arthur D. Skiathas, El Sobrante, Calif., assignors to Imperial West Chemical Company, Reno, Nev.

Continuation of Ser. No. 24,941, Mar. 29, 1979, Pat. No. 4,252,776. This application Dec. 30, 1980, Ser. No. 221,380
Int. Cl.³ C01F *7/74*
U.S. Cl. 423—132 16 Claims

1. A method for the manufacture of aluminum sulfate from the reactants comprising sulfuric acid and aluminum dross tailings comprising a mixture of water soluble salts, aluminum oxides and aluminum metal particles which comprises treatment of aluminum dross tailings by:

(a) washing said aluminum dross tailings with water to remove water soluble salts and form an aqueous slurry of aluminum oxides and aluminum metal particles containing no more than about 1 weight percent soluble salts;

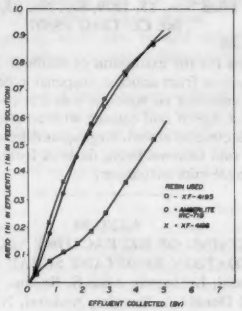
(b) heating said slurry to a temperature from 185 to about 225 degrees F. and agitating said slurry to cause sufficient particle-to-particle attrition to remove the aluminum hydroxide protective film on the aluminum metal particles to reduce the metallic aluminum content of said slurry to less than about 0.5 weight percent and thereby produce treated dross tailings, and thereafter reacting the treated dross tailings with sulfuric acid having a concentration from 30 to 99.4 weight percent at a temperature from 225 degrees to 360 degrees F. and at sufficient pressure at said temperature to maintain said reactants in liquid phase, for a time from 5 to 45 minutes, and recovering aluminum sulfate from the resulting reaction product.

4,320,099

PROCESS FOR NICKEL REMOVAL FROM CONCENTRATED AQUEOUS COBALTOUS SULFATE SOLUTIONS

Juraj Babjak, Mississauga, Canada, assignor to Inco Limited, Toronto, Canada

Filed Jul. 28, 1980, Ser. No. 172,670
Int. Cl.³ B01D *11/00*; C01G *51/00*; C22B *1/00*
U.S. Cl. 423—139 4 Claims



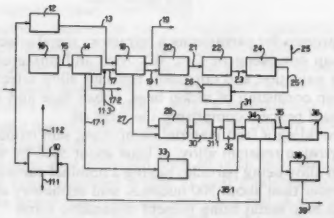
1. A process for removing nickel from an aqueous cobaltous sulfate solution which contains dissolved nickel and at least 50 grams per liter of dissolved cobalt comprising adjusting the pH of the aqueous solution if necessary to a value of between about 2 and 6, and contacting the solution at a temperature of about 20° to 60° C. with a chelating ion-exchange resin having bis(2-picolyl)amine functional groups to selectively load nickel onto the resin and produce a purified solution characterized by a concentration ratio of dissolved cobalt to dissolved nickel which exceeds 200 from which high purity cobalt can be recovered.

4,320,100

PURIFICATION OF GAS MIXTURES

Andre D. Engelbrecht, Sandton, and Gerardus J. van den Houten, Glen Randburg, both of South Africa, assignors to AECI Limited, Johannesburg, South Africa

Filed Feb. 14, 1980, Ser. No. 121,579
Claims priority, application South Africa, Mar. 6, 1979, 79/1039
Int. Cl.³ B01D *53/36*; C01B *3/02*; C01C *1/04*
U.S. Cl. 423—219 11 Claims



1. A process for the purification of a hydrogen-containing raw synthesis gas mixture which comprises 10% to 45% by volume of hydrogen on a dry basis, together with carbon oxides, at least 50 ppm hydrogen cyanide and impurities including at least one gas selected from a nitrogen oxide and oxygen and at least one sulphur-containing gas, and which is substantially free of hydrocarbons other than methane, said process comprising passing the gas mixture over a sulphur-resistant hydrogenation catalyst at a temperature of from 120°

to 250° C. and at a pressure of from 0.5 to 250 bar to remove at least one gas selected from nitrogen oxides and oxygen therefrom while retaining a hydrogen cyanide content of at least 50 ppm.

4,320,101
REMOVAL OF SULFUR FROM WASTE GAS STREAMS

H. Lee Trentham, Galveston; John H. Crow, Houston, both of Tex., and Farwell C. Boston, Shreveport, La., assignors to Trentham Corporation, Houston, Tex.

Filed Nov. 24, 1980, Ser. No. 209,719
Int. Cl.³ C01B *17/00*
U.S. Cl. 423—243 **16 Claims**

1. A process for preferentially absorbing sulfur dioxide from a gaseous mixture comprising the steps of:

(a) contacting the gaseous mixture with a sulfur dioxide-lean water soluble trialkyl phosphate phase containing from about 8 to about 30% by weight water in an absorption zone to absorb sulfur dioxide from said gas and form a sulfur dioxide-rich trialkyl phosphate phase;

(b) subsequently contacting said gas mixture with a sulfur dioxide-lean buffered water phase said buffered water phase containing a buffering agent selected from the group consisting of alkanolaminium carboxylates, alkali metal salts of carboxylic acids or benzoic acid, and ammonium salts of carboxylic acids or benzoic acid to absorb residual sulfur dioxide remaining in said gas and forming a sulfur dioxide-rich buffered water phase and venting said gas from the process;

(c) continuously mixing the rich buffered water phase of step (b) with the trialkyl phosphate phase in step (a) and withdrawing the mixed phase solution from the absorption zone of step (a);

(d) regenerating the rich trialkyl phosphate phase of the mixed phase solution to liberate a first concentrated sulfur dioxide gas stream and form a sulfur dioxide-lean trialkyl phosphate phase;

(e) separating the lean trialkyl phosphate phase from the sulfur dioxide-rich buffered water phase for return to step (a);

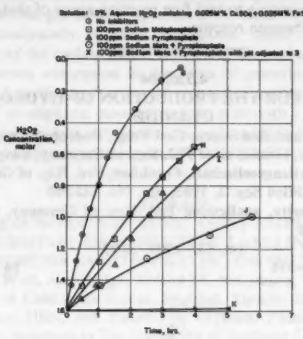
(f) regenerating the rich buffered water phase to liberate a second concentrated sulfur dioxide gas stream and form a lean buffered water phase for return to step (b).

4,320,102
METHOD OF STABILIZING HYDROGEN PEROXIDE SOLUTIONS

Augustine I. Dalton, Jr., Allentown, and Jeffery V. Bauer, Macungie, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 10, 1980, Ser. No. 195,816
Int. Cl.³ C01B *15/037, 15/01, 15/00*
U.S. Cl. 423—273 **8 Claims**

1. A method of stabilizing aqueous hydrogen peroxide solutions against decomposition catalyzed by a combination of iron and copper consisting of adding to the solution an amount of a combination of alkali metal meta- and pyrophosphates in ratios

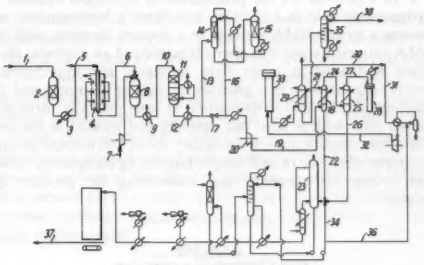


of 20:1 to 1:20 by weight effective to prevent decomposition and adjusting the pH of the solution to 2–4.

4,320,103
FLEXIBLE INTEGRATED METHOD FOR THE PRODUCTION OF AMMONIA AND UREA

Giorgio Pagani, Milan, Italy, assignor to Snamprogetti S.p.A., Milan, Italy

Continuation of Ser. No. 54,484, Jul. 3, 1979, abandoned, which is a continuation-in-part of Ser. No. 867,974, Jan. 9, 1978, abandoned, which is a continuation of Ser. No. 670,729, Mar. 26, 1976, abandoned. This application Sep. 4, 1980, Ser. No. 184,175
Claims priority, application Italy, Mar. 28, 1975, 21778 A/75
Int. Cl.³ C01C *1/04*; C07C *126/00*
U.S. Cl. 423—359 **2 Claims**



1. In an integrated flexible method for the production of ammonia and urea comprising feeding a partially decarbonated gaseous stream consisting essentially of CO_2, N_2 and H_2 to an ammonium carbamate reactor to thereby form an ammonium carbamate solution, feeding said ammonium carbamate solution to a urea reactor, and recovering urea from said reactor, the improvement comprising:

(a) reacting in a first reaction space of said ammonium carbamate reactor said partially decarbonated gaseous stream with a concentrated aqueous solution of ammonia to thereby form an ammonium carbamate solution;

(b) feeding the unreacted partially decarbonated gaseous stream to a second reaction space of said ammonium carbamate reactor;

(c) reacting said unreacted partially decarbonated gaseous stream with an ammonia rich ammonium carbonate solution to thereby form an ammonium carbamate solution;

(d) feeding N_2 and H_2 obtained from said second reaction space to an ammonia systhesis reactor to thereby produce ammonia;

(e) feeding said ammonia to an ammonia absorber to form a concentrated aqueous solution of ammonia; and

(f) feeding a first portion of said concentrated aqueous solution of ammonia to said first reaction space of said ammonium carbamate reactor.

4,320,104

PROCESS FOR THE PRODUCTION OF HYDROGEN CYANIDE

Friedrich Bittner, Bad Soden; Carl Voigt, Rodenbach, and Peter Kleinschmit, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 3, 1980, Ser. No. 183,955

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1979, 2935784

Int. Cl.³ C01C *3/02*

U.S. Cl. 423—375 **14 Claims**

1. In a process for the production of hydrogen cyanide or hydrocyanic acid in a reaction tube from a hydrocarbon and ammonia by the BMA process or a process identical with the BMA process except that there is employed an aliphatic short chain hydrocarbon other than methane, the improvement comprising blowing in a gaseous mixture of ammonia and the aliphatic short chain hydrocarbon at least partially through a supply pipe with at least one opening and located in the interior of the reaction tube at a velocity above 200 meters/second, the upper diameter of said supply pipe being completely closed and having no openings, and recovering the product gas formed.

4,320,105

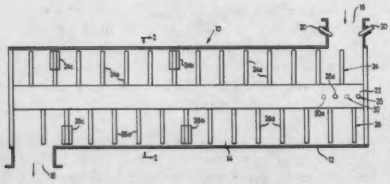
PELLITIZING METHOD

Joseph R. Nelli; Johnney G. Bowers, and Eustace R. Conway, all of Gastonia, N.C., assignors to Lithium Corporation of America, Gastonia, N.C.

Filed Oct. 20, 1980, Ser. No. 199,068

Int. Cl.³ C01P *15/00*; B01J *2/10*

U.S. Cl. 423—421 **7 Claims**



1. A method of forming pulverulent, powder, or powder-like materials into pellets comprising: introducing a pulverulent material into an elongated chamber having an inlet and an outlet, said chamber being provided with a rotatable shaft positioned along the longitudinal axis thereof, said shaft being provided with a plurality of spaced, outwardly extending fingers along its length, the number of said fingers on the shaft being greater at the inlet of the chamber than at the outlet thereof, at least two of the fingers located between the inlet and the outlet of the chamber having retarding means thereon for impeding the movement of the material in the chamber, contacting the pulverulent material with water as it is introduced into the chamber, rotating said shaft at a rate sufficient to maintain the pulverulent material in a turbulent state and to atomize the water introduced into the chamber to initiate agglomeration of the pulverulent material, moving the initially agglomerated material along the chamber in the direction of the outlet thereof while continuing to maintain the initially agglomerated pulverulent material in a turbulent state to bring about further agglomeration of the pulverulent material, impeding the movement of the agglomerated material with the retarding means on said at least two fingers located between the inlet and the outlet of the chamber to effect further agglomeration of the material into pellets and to bring about densification of the pellets, discharging the formed pellets at the outlet of the chamber, and subjecting the pellets to heat to reduce the water content thereof.

4,320,106

METHOD FOR PREPARING SODIUM BICARBONATE AND HYDROGEN CHLORIDE

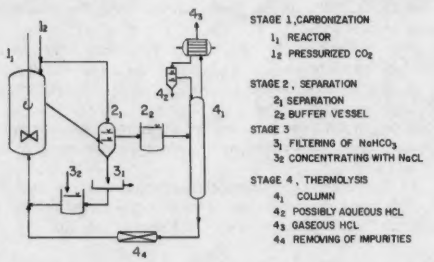
Bernhard Hentschel; Jürgen Ziebarth, both of Marl; Alfred Coenen, Maria Laach; Kurt Kosswig, Marl, and Ferdinand V. Praun, Haltern, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Division of Ser. No. 193,591, Oct. 3, 1980. This application Oct. 23, 1980, Ser. No. 200,035

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1979, 2940628; Aug. 19, 1980, 3031213

Int. Cl.³ C01D *7/00*; C01B *7/07*

U.S. Cl. 423—424 **17 Claims**



1. In a method for producing sodium bicarbonate and hydrogen chloride by reacting an aqueous sodium chloride solution with carbon dioxide in the presence of an amine and an organic solvent, the improvement comprising:

(a) introducing said carbon dioxide under pressure into a mixture comprising

(A) said aqueous sodium chloride solution,

(B) said amine comprising a tertiary amine,

(C) said organic solvent comprising at least one polar, organic solvent having a boiling point above 140° C.,

(D) said organic solvent comprising at least one non-polar, organic solvent, to produce an aqueous phase and at least one organic phase;

(b) separating said aqueous phase and said organic phase under the same pressure as step (a);

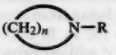
(c) separating said sodium bicarbonate from said aqueous phase, reconcentrating said separated aqueous phase with

sodium chloride and feeding back said reconcentrated aqueous phase into step (a);

(d) separating said hydrogen chloride from said organic phase containing said non-polar organic solvent and said polar organic solvent by heating and said amine; and

(e) recirculating said amine and said polar and nonpolar organic solvents to step (a);

said tertiary amine being an N-alkyl-azacycloalkane with a total of at least 14 C atoms having the general formula



wherein n is an integer from 4 to 12, R is an alkyl group having 1–18 carbon atoms and where any methylene group may be substituted by alkyl groups with a maximum of 6 carbon atoms in the total sum of alkyl groups.

4,320,107
PROCESS FOR PRODUCING CARBON FIBERS

Mikio Oyabu, Shozan; Kenji Fukuda, Aoba, and Keiichi Hirata, Enmeiji, all of Japan, assignors to Mitsui Coke Co. Ltd., Tokyo, Japan

Filed Nov. 23, 1979, Ser. No. 96,971

Claims priority, application Japan, Dec. 21, 1978, 53-156910; Dec. 25, 1978, 53-158669

Int. Cl.³ D01F *9/14*

U.S. Cl. 423—447.6 **2 Claims**

1. A process for producing carbon fibers which comprises:

(a) providing as a starting material a solid solvent-refined coal having a softening point of from 200° C. to 250° C. and an insolubles content of 0.5% by weight or less, said solid solvent-refined coal being obtained by hydrogenating coal in a hydrocarbon solvent at a temperature of 300°–500° C. under a hydrogen pressure of 3–300 Kg/cm^2 and eliminating the hydrocarbon solvent;

(b) subjecting said solvent-refined coal to melt spinning to form a fiber;

(c) heating said fiber in air at a rate of 3–10° C./minute to render said fiber non-fusible; and

(d) carbonizing said non-fusible fiber in an inert atmosphere to form said carbon fiber.

4,320,108
PROCESS FOR THE REMOVAL OF METALS FROM CARBON BLACK

Manfred Wolter, Hürth, and Gero Heymer, Erftstadt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 3, 1980, Ser. No. 203,531

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2944916

Int. Cl.³ C01B *31/02*

U.S. Cl. 423—461 **6 Claims**

1. A process for the removal of metals selected from the group consisting of iron, nickel, vanadium and their compounds, from carbon black, which comprises: treating, with agitation, an aqueous suspension of the carbon black having a solid matter content of 0.5 to 4% by weight and a temperature of 30° to 90° C., with chlorine gas by passing said chlorine gas into the aqueous suspension over a period of 15 to 180 minutes; said chlorine gas being employed in 10 times to 100 times the stoichiometrically required proportion, based on the metal content of the carbon black; separating the carbon black from the aqueous suspension in the form of granular material by adding 5 to 15 g, per gram of suspended carbon black, of a straight-chain alcohol with 4 to 9 C-atoms to said suspension; and freeing the carbon black from adhering water and alcohol by heating to 150° to 350° C.

2. A process for the removal of metals selected from the group consisting of iron, nickel, vanadium and their compounds, from carbon black, which comprises: treating, with agitation, an aqueous suspension of the carbon black having a solid matter content of 0.5 to 4% by weight and a temperature of 30° to 90° C., with chlorine gas by passing said chlorine gas into the aqueous suspension over a period of 15 to 180 minutes; said chlorine gas being employed in 10 times to 100 times the stoichiometrically required proportion, based on the metal content of the carbon black; separating the carbon black from the aqueous suspension in the form of granular material by adding 5 to 15 g, per gram of suspended carbon black, of an ester of an aliphatic monocarboxylic acid with 2 to 4 C-atoms to said suspension; and freeing the carbon black from adhering water and ester by heating to 150° to 350° C.

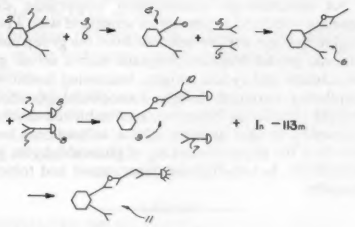
4,320,109
IMMUNORADIOMETRIC ASSAY EMPLOYING TERMINAL RADIONUCLIDE LABELING AND SYNTHESIS OF CONJUGATES FOR SUCH ASSAY

Walter Wolf, Northridge; Robert M. Nakamura, Rolling Hills, both of Calif.; Ata Gokce, Istanbul, Turkey; Manuel Tubis, Laguna Hills, and Timothy J. O'Brien, Pasadena, both of Calif., assignors to The University of Southern California, Los Angeles, Calif.

Filed Jun. 29, 1979, Ser. No. 53,472

Int. Cl.³ G01N *33/48, 33/56*; A61K *43/00*

U.S. Cl. 424—1 **21 Claims**



1. In a method of immunoradiometric assay in which (a) an antigen and (b) an antibody specific to said antigen, are reacted to form a first complex which is reacted with a universal antibody for said complex from a species different from that of said specific antibody to form a second complex, and said second complex is separated from unreacted universal antibody and measured, the improvement according to which said universal antibody comprises a component capable of binding a radionuclide and including the steps of reacting a radionuclide with said separated second complex to bind said radionuclide to said universal antibody and measuring the radioactivity of said bound radionuclide.

4,320,110
CARNITINE AND ITS USE IN REDUCING CARDIAC TOXICITY AND AS A SYNERGIST WITH CYTOSTATS

Stephen L. De Felice, 430 Topping Hill Rd., Westfield, N.J. 07090

Division of Ser. No. 917,944, Jun. 22, 1978, which is a division of Ser. No. 799,473, May 23, 1977, which is a continuation-in-part of Ser. No. 681,063, Apr. 28, 1976, which is a continuation-in-part of Ser. No. 485,301, Jul. 2, 1974, Pat. No. 3,968,241, which is a continuation-in-part of Ser. No. 303,772, Nov. 6, 1972, Pat. No. 3,830,931. This application Oct. 4, 1979, Ser. No. 81,821

Int. Cl.³ A61K *31/70, 31/71, 31/195*

U.S. Cl. 424—10 **3 Claims**

1. A method of reducing cardiac toxicity which results from the administration to a human of a cytostat selected from the group consisting of Rubidazone, Actinomycin and Carminomycin, which results in cardiac toxicity, which method comprises administering to such a human in need there of an amount of β-hydroxy-γ-trimethylaminobutyric acid, an isomer

thereof, a pharmaceutically acceptable salt thereof, or a pharmaceutically acceptable salt of an isomer thereof, sufficient to reduce cardiac toxicity.

4,320,111

IMMUNOLOGIC COMPOSITIONS METHODS OF PREPARATION AND USE

Michael A. Hirsch, East Windsor, N.J.; Douglas S. Irvine, Rosemere, and John Krupey, Montreal, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 806,563, Jun. 14, 1977, abandoned. This application Mar. 6, 1980, Ser. No. 127,630

Int. Cl.[3] **G01N** *31/06, 33/48, 33/54, 33/74*

U.S. Cl. 424—12 **18 Claims**

1. An immunologic composition comprising pyruvic aldehyde stabilized erythrocytes sensitized with a polypeptide or glycoprotein antigen selected from the group consisting of chorionic gonadotrophin, pregnant mare's serum gonadotrophin, carcino embryonic antigen, luteinizing hormone, follicle stimulating hormone, human menopausal gonadotrophin and thyroid stimulating hormone, said stabilized erythrocytes being coupled to said antigen with a bifunctional molecule selected from the group consisting of glutaraldehyde, glyoxal, succinaldehyde, hexamethylene diisocyanate, toluene 2,4-diisocyanate, dimethyl suberimidate.

18. An immunologic composition comprising dimethyl suberimidate stabilized erythrocytes sensitized with a polypeptide or glycoprotein antigen selected from the group consisting of chorionic gonadotrophin, pregnant mare's serum gonadotrophin, carcino embryonic antigen, luteinizing hormone, follicle stimulating hormone, human menopausal gonadotrophin and thyroid stimulating hormone, said stabilized erythrocytes being coupled to said antigen with a bifunctional molecule selected from the group consisting of glutaraldehyde, glyoxal, succinaldehyde, hexamethylene diisocyanate and toluene 2,4-diisocyanate.

4,320,112

COMPOSITION FOR PEST REPELLENT RECEPTACLE

Lonnie R. Jones, P.O. Box 188, and Joseph L. Hill, P.O. Box 3784, both of Wilson, N.C. 27893

Filed Jun. 6, 1980, Ser. No. 157,063

Int. Cl.[3] **A01N** *25/34, 35/00, 27/00*

U.S. Cl. 424—19 **4 Claims**

1. A pest repelient receptacle useful for holding trash and formed from a synthetic resin, said resin having about 5 to 25% by weight of an active ingredient mixed therein prior to the formation of the receptacle, said active ingredient comprising naphthalene and citronella oil in amounts capable of repelling insects and other animals, the ratio of naphthalene to citronella oil being in the range from about 4:1 to about 16:1 by weight.

4,320,113

PROCESS FOR CONTROLLING COCKROACHES AND OTHER CRAWLING INSECTS

Agis F. Kydonieus, New York, N.Y., assignor to Herculite Protective Fabrics Corporation, New York, N.Y.

Continuation of Ser. No. 603,052, Aug. 8, 1975, Pat. No. 4,102,991. This application May 15, 1978, Ser. No. 906,307

The portion of the term of this patent subsequent to Jul. 25, 1995, has been disclaimed.

Int. Cl.[3] **A01N** *25/10, 25/34, 43/02, 57/00*

U.S. Cl. 424—27 **7 Claims**

1. A process for the control of cockroaches in structures comprising

deploying in the harborages and crawlpaths of the cockroaches a plurality of strips of controlled release dispenser material

said material comprising a strip of solid, non-porous, polymeric material into which effective amounts of a non-volatile contact effective insecticide for cockroaches may be incorporated and from which said insecticide is gradually released, said insecticide being present in said solid, non-porous, polymeric material in an amount sufficient to achieve effective levels of knockdown and kill upon contact with said cockroaches for a period on the order of about 2 seconds and said insecticide being capable of being incorporated into said solid, non-porous polymeric material and being released therefrom by the molecular migration of said insecticide through and to the surface of said strips,

the cumulative surface area of said insecticide bearing surfaces of said strips being from about $\frac{1}{2}$ to about 3 sq. ft. per from about 100 to 150 sq. ft. of floor area of the structure in which control of said cockroaches is sought.

4,320,114

MANUFACTURE OF AQUEOUS POLYVINYLPYRROLIDONE-IODINE SOLUTIONS

Walter Denziger, Speyer; Karl Herrle, Ludwigshafen, and Hans-Uwe Schenck, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 961,706, Nov. 17, 1978, abandoned, which is a continuation of Ser. No. 876,988, Feb. 13, 1978, abandoned, which is a continuation of Ser. No. 710,426, Aug. 2, 1976, abandoned. This application Aug. 27, 1980, Ser. No. 181,802

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1975, 2540170

Int. Cl.[3] **A61K** *31/79*

U.S. Cl. 424—80 **11 Claims**

1. A process for the preparation of a stable aqueous solution of PVP-iodine which comprises:

mixing in an aqueous medium

(a) PVP as an aqueous solution of from 10 to 60% strength by weight, wherein said PVP has a K value of from 8 to 50 and has been prepared in the form of an aqueous solution by the steps of

(1) polymerizing vinylpyrrolidone in an organic solvent which is an aromatic hydrocarbon or a lower aliphatic monohydric alcohol of 1 to 4 carbon atoms at a concentration of monomer of from 10 to 80% by weight and in the presence of a free radical initiator which is an organic per-compound selected from the group consisting of alkyl hydroperoxides and dialkyl peroxides of 1 to 8 carbon atoms per alkyl and per esters in an amount of about 0.1 to 5% by weight, based on vinylpyrrolidone,

(2) mixing the resulting solution of PVP in the organic solvent with water,

(3) distilling off the organic solvent to give an aqueous solution of PVP, and

(4) treating the aqueous solution of PVP with steam in the amount of from 20 to 200% of steam based on the weight of PVP; with

(b) iodine in an amount of from 5 to 60% by weight, based on PVP;

and with

(c) a compound which provides iodide ions in an amount of from 10 to 200% by weight, calculated as iodide ions and based on the amount of iodine employed.

4,320,115

RABIES VIRUS VACCINE

Gosse Bijlenga, St. Didier au Mont d'Or, France, assignor to Gist-Brocades N.V., Delft, Netherlands

Filed Jan. 25, 1978, Ser. No. 872,056

Claims priority, application United Kingdom, Jan. 26, 1977, 3258/77

Int. Cl.[3] **A61K** *39/205*

U.S. Cl. 424—84 **16 Claims**

1. A live or inactivated rabies virus vaccine wherein the virus vaccine is derived from a rabies strain novel species No. 675 deposited with Czechoslovak National Collection of Type

Culture of the Institute of Hygiene and Epidemiology in Prague and is in an injectable pharmaceutically acceptable liquid, the amount of vaccine being sufficient to combat rabies infections.

13. A method of protecting wild carnivores from rabies infection comprising orally administering to said carnivores an immunizing dose of the attenuated rabies vaccine strain no. 675 containing a temperature stabilizer, said vaccine being enclosed in a bite-permeable container and said container being surrounded by an acceptable meat bait for said carnivores.

4,320,116
FOODSTUFFS, ANIMAL FEEDING STUFFS AND PHARMACEUTICAL PREPARATIONS CONTAINING AN ANTIBACTERIAL SYSTEM

Karl E. L. Björck, Upsala, Sweden, assignor to Astra-Ewos AB, Sodertalje, Sweden

Continuation of Ser. No. 774,649, Mar. 4, 1977, abandoned. This application Sep. 13, 1979, Ser. No. 75,245
Claims priority, application Sweden, Mar. 8, 1976, 7603075
Int. Cl.[3] A61K *31/17, 33/00, 33/40*
U.S. Cl. 424—129 **13 Claims**

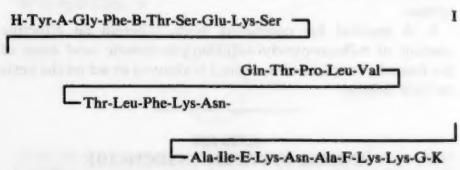
1. Foodstuff and animal feedstuff comprising foodstuff and animal agents as an antibacterial system capable of being activated in the gastrointestinal tract, the antibacterial system comprising lactoperoxidase, a thiocyanate selected from the group consisting of sodium thiocyanate, potassium thiocyanate and ammonium thiocyanate and a solid water soluble peroxide donor selected from the group consisting of an alkali percarbonate, an alkali earth metal peroxide and a carbamide peroxide, wherein the thiocyanate is present in an effective amount of at least 16 ppm of the total composition calculated as NaSCN, the solid, water soluble peroxide donor is present in an effective amount of at least 21 ppm of the total composition calculated as sodium percarbonate, and lactoperoxidase is present in the form of a lactoperoxidase-containing milk product in an effective amount of at least 1 mg/kg of the total composition, the molar relationship between peroxide donor and thiocyanate being less than 1–2:1.

4,320,117
POLYPEPTIDE

Anand S. Dutta; James J. Gormley; Christopher F. Hayward; John S. Morley, and Gilbert J. Stacey, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 24, 1977, Ser. No. 799,938
Claims priority, application United Kingdom, Jun. 21, 1976, 25642/76; Oct. 28, 1976, 44839/76
Int. Cl.[3] A61K *37/00;* **C07C** *103/52*
U.S. Cl. 424—177 **7 Claims**

1. A polypeptide of the formula:



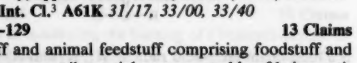
in which A is selected from the group consisting of D-Ala, D-Ser and D-Met, B is selected from the group consisting of Leu and Met, E is selected from the group consisting of Val and Ile, F is selected from the group consisting of His and Tyr, G is selected from the group consisting of Gly-Gln, Gly-Glu and a direct bond, and K is selected from the group consisting of a hydroxy radical, an amino radical and an alkoxy radical of 1 to 6 carbons; and the pharmaceutically-acceptable acid-addition salts thereof, and, where the polypeptide of the formula I contains a free carboxy group, the pharmaceutically-acceptable base-addition salts thereof.

4,320,118
DECA-, UNDECA-, DODECA- AND TRIDECAPEPTIDES WITH THYMIC ACTIVITY

Abraham White, deceased, late of Palo Alto, Calif. (by Edna White, administrator); John J. Nestor, San Jose, Calif.; Gordon H. Jones, and Pamela M. Burton, both of Cupertino, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Dec. 22, 1980, Ser. No. 218,886
Int. Cl.[3] A61K *37/00;* **C07C** *103/52*
U.S. Cl. 424—177 **15 Claims**

1. A peptide of the formula:



and the pharmaceutically acceptable salts thereof, wherein:

A, A′ and A″ are each independently Gly, D-Ala, D-Leu, or D-Trp; wherein A may optionally be N-alkylated or N-acylated;

B is Pro, α^3-Pro, Thz, or diMeThz;

C and C′ are each independently Thr, Ser, Val, or alloThr;

D is Glu, Gln, Asp, or Asn;

R is hydrogen, or lower alkyl or lower acyl, substituted for one of the hydrogens on the ϵ-amino group of the lysyl residue;

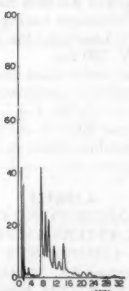
X is Cys, Ala, ABU, or Cys(Me); and

Y is selected from the group consisting of hydroxy, Pro, Pro-Leu, and Pro-Leu-Met; $-NH_2$, $ProNH_2$, $Pro\text{-}LeuNH_2$ and Pro-leu-Met-NH_2.

4,320,119
EXTRACTS OF *MARSDENIA CUNDURANGO* REICHENBACH FIL

Den-ichi Mizuno, Kamakura; Hiroshi Mitsuhashi, Sapporo; Shigeru Abe, Tokyo, and Koji Hayashi, Sapporo, all of Japan, assignors to Kenyaky Yogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1980, Ser. No. 178,903
Claims priority, application Japan, Aug. 23, 1979, 54/107366
Int. Cl.[3] A61K *31/705, 31/78*
U.S. Cl. 424—182 **4 Claims**



1. An extract of *Marsdenia cundurango* Reichenbach fil. which is soluble in C_{1-3} lower alcohols and in chloroform and dichloromethane and insoluble in pentane, hexane and heptane, and shows the chromatogram depicted in FIG. 1 of the accompanying drawings when subjected to analytical HPLC in which the filler is totally porous crushed type silica gel, 5 μ; the column has an i.d. of 4 mm and a length of 200 mm; the eluant is a mixture of n-hexane/chloroform/methanol having a

volumetric ratio of 7:2:1; the flow rate is 1.5 ml/min.; the pressure is 30 kg/cm^2; and detection is at U.V. 280 nm.

3. A pharmaceutical composition characterized by containing the extract of *Marsdenia cundurango Reichenbach fil.* as described in claim 1 in an amount effective against Sarcoma-180 and Ehrlich carcinoma tumors, and a pharmaceutically acceptable diluent or carrier.

4,320,120

EXTRACTS OF *MARSDENIA CUNDURANGO* REICHENBACH FIL

Hiroshi Mitsuhashi, Sapporo; Den-ichi Mizuno, Kamakura; Koji Hayashi, Sapporo; Shigeru Abe, Tokyo; Muneaki Takase, Oizumimachi, and Toshiharu Narita, Higashimurayama, all of Japan, assignors to Zenyaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1980, Ser. No. 179,001

Claims priority, application Japan, Oct. 22, 1979, 54-136061; Mar. 5, 1980, 55-27696; Mar. 5, 1980, 55-27697; Apr. 19, 1980, 55-52097

Int. Cl.^{3} A61K *31/705, 35/78*

U.S. Cl. 424—182 **13 Claims**

1. An extract of *Marsdenia cundurango* Reichenbach fil. which is soluble in C_{1-3} lower alcohols and in chloroform and dichloromethane and insoluble in pentane, hexane, heptane, carbon tetrachloride, toluene and benzene, and shows the chromatogram depicted in FIG. 4 of the acompanying drawings when subjected to analytical HPLC in which the filler is totally porous crushed type silica gel. 5μ; the column has an i.d. of 4 mm and a length of 200 mm; the eluent is a mixture of n-hexane/chloroform/methanol having a volumetric ratio of 7:2:1; the flow rate is 1.5 ml/min.; the pressure is 30 kg/cm^2; and detection is at U.V. 280 nm.

12. A pharmaceutical composition characterized by containing the extract of *Marsdenia cundurango* Reichenbach fil. as described in any one of claims 1–3 in an amount effective against Sarcoma-180 and Ehrlich carcinoma tumors, with a pharmaceutically acceptable diluent or carrier.

4,320,121

METHOD OF EMULSIFYING CHOLESTEROL, CHOLESTEROL ESTERS AND TRIGLYCERIDE COMPOUNDS

Barry D. Sears, 5 Cleveland Rd., Marblehead, Mass. 01945

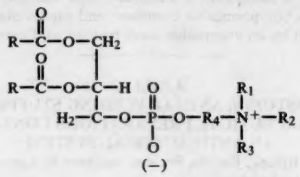
Continuation of Ser. No. 878,521, Feb. 17, 1978, abandoned, which is a continuation of Ser. No. 731,132, Oct. 12, 1976, Pat. No. 4,086,257, Ser. No. 770,290, Feb. 22, 1977, Pat. No. 4,097,503, Ser. No. 770,407, Feb. 22, 1977, Pat. No. 4,097,502, and Ser. No. 807,373, Jun. 17, 1977, Pat. No. 4,145,410. This application Nov. 5, 1979, Ser. No. 90,994

The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.

Int. Cl.^{3} A61K *31/685;* C07F *9/02, 9/10*

U.S. Cl. 424—199 **15 Claims**

1. A method of emulsifying a water-insoluble compound to form a mixed micelle product, which method comprises: admixing a water-insoluble compound, selected from the group consisting of water-insoluble compounds of cholesterol, cholesterol esters and triglycerides, with a synthetic quaternary-ammonium phosphatidyl compound having the general structural formula:



wherein

is a long-chain fatty-acid radical; R_1, R_2 and R_3 are alkyl radicals, which alkyl radicals have in total four or more carbon atoms; and R_4 is a C_1–C_{10} polymethylene radical.

10. The mixed micelle product produced by the method of claim 1.

4,320,122

6-FLUOROPYRIDYL-(di)(thio)PHOSPHORIC ACID ESTERS

Hans Theobald; Heinrich Adolphi, both of Limburgerhof; Karl Eicken, Wachenheim, and Heinz-Guenter Oeser, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 30, 1980, Ser. No. 154,753

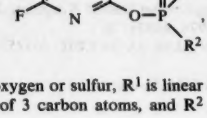
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924150

Int. Cl.^{3} A01N *57/08;* C07F *9/58*

U.S. Cl. 424—200 **8 Claims**

1. A 6-fluoropyridyl-(di)(thio)phosphoric acid ester of the formula

I



where X is oxygen or sulfur, R^1 is linear or branched alkyl of a maximum of 3 carbon atoms, and R^2 is propylthio or butylthio.

5. A method for combating tests, wherein an effective amount of 6-fluoropyridyl-(di)(thio)phosphoric acid ester of the formula I as claimed in claim 1 is allowed to act on the pests or their habitat.

4,320,123

ANIMAL SYSTEMIC INSECTICIDE

Ashley H. Freiberg, Santa Clara, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 29, 1980, Ser. No. 220,941

Int. Cl.^{3} C07D *309/06;* A61K *31/665*

U.S. Cl. 424—203 **6 Claims**

1. O,O-Dimethyl-2,2,2-trichloro-1-hydroxy-1-(pyranyl-2-oxy) ethylphosphonate.

2. A method of killing insect larvae in an animal having an opening infested with said larvae comprising administering an insecticidally effective amount of O,O-dimethyl-2,2,2-tri-

chloro-1-hydroxy-1-(pyranyl-2-oxy) ethylphosphonate to said animal.

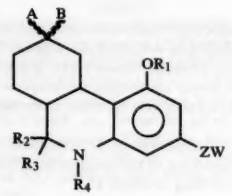
4,320,124

COMPOSITION FOR ENHANCING BINDING OF A BENZODIAZEPINE TO CENTRAL BENZODIAZEPINE RECEPTORS AND USE THEREOF

Billie K. Koe, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 17, 1980, Ser. No. 197,872
Int. Cl.[3] A61K *31/33, 31/47*
U.S. Cl. 424—244 15 Claims

1. A method of enhancing the binding of a benzodiazepine to central benzodiazepine receptors in a mammal which comprises concurrently administering to said mammal a benzodiazepine and a benzodiazepine enhancing amount of an analgesic agent having the formula



wherein

A and B when taken together are oxo;

A when taken individually is hydrogen;

B when taken individually is hydroxy or (C_{2-5})alkanoyloxy;

R_1 is hydrogen or (C_{2-5})alkanoyl;

R_2 is hydrogen or (C_{1-6})alkyl;

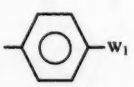
R_3 is hydrogen, methyl or ethyl;

R_4 is hydrogen or (C_{1-6})alkyl;

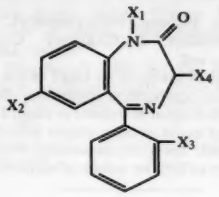
Z is alkylene having from one to nine carbon atoms or $(alk_1)_m$—O—$(alk_2)_n$ wherein each of (alk_1) and (alk_2) is alkylene having from one to nine carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than nine;

each of m and n is 0 or 1; and

W is hydrogen or



wherein W_1 is hydrogen, fluoro or chloro, or a pharmaceutically acceptable acid addition salt thereof, wherein said benzodiazepine is 7-chloro-2-methylamino-5-phenyl-3H-1,4-benzodiazepine-4-oxide; 8-chloro-6-phenyl-4H-[1,2,4]-triazolo[4,3-a][1,4]-benzodiazepine; 7-chloro-1,3-dihydro-3-hydroxy-5-phenyl-2H-1,4-benzodiazepin-2-one; 8-chloro-6-(2-chlorophenyl)-4H-[1,2,4]-(3-chloro-triazolo)[4,3-a]-[1,4]-benzodiazepine; 7-chloro-1,3-dihydro-1-methyl-5-phenyl-2H-1,4-benzodiazepine; 7-chloro-1,3-dihydro-1-methyl-5-(cyclohex-1-enyl)-2H-1,4-benzodiazepin-2-one; or those having formula II:



II

wherein the variables have the following values:

	X_1	X_2	X_3	X_4
(a)	CH_3	Cl	H	H
(b)	H	Cl	H	OH
(c)	H	Cl	H	H
(d)	CH_3	NO_2	F	H
(e)	$CH_2CH{\equiv}CH$	Cl	H	H
(f)	CH_3	NO_2	H	H
(g)	$CH_2CH_2N(C_2H_5)_2$	Cl	F	H
(h)	H	Cl	H	COOK . KOH
(i)	H	NO_2	Cl	H
(j)	H	Cl	Cl	OH
(k)		Cl	H	H
(l)	H	NO_2	H	H
(m)	CH_3	Cl	H	OH
(n)	CH_3	Cl	H	$OCON(CH_3)_2$

or a pharmaceutically acceptable salt of said benzodiazepine wherein the weight ratios of analgesic to benzodiazepine are from 1:1 to 1:00.

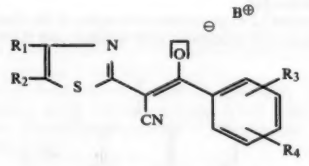
4,320,125

THIAZOLYLIDENE-OXO-PROPIONITRILE SALTS AND INSECTICIDAL COMPOSITIONS CONTAINING THESE SALTS

Reinhold Puttner; Ulrich Bühmann, and Hartmut Joppien, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed May 13, 1980, Ser. No. 149,449
Claims priority, application Fed. Rep. of Germany, May 17, 1979, 2920182
Int. Cl.[3] A01N *43/84, 43/28;* C07D *417/02, 277/30*
U.S. Cl. 424—248.51 17 Claims

1. Thiazolylidene-oxo-propionitrile salts of the formula



wherein

R_1 is hydrogen, halogen, C_1–C_6-alkyl, C_3–C_6-cycloalkyl, thienyl, pyridyl or phenyl substituted in one or several positions by the same or different radicals from the group constituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogeno, trifluoromethyl, nitro and cyano;

R_2 is hydrogen, halogen, C_1–C_6-alkyl, C_3–C_6-cycloalkyl, thienyl, pyridyl, phenyl, or phenyl substituted in one or several positions by the same or different radicals selected from the group consisting of C_1–C_4-alkyl, C_1–C_4-alkoxy, halogeno, trifluoromethyl, nitro and cyano;

R_3 is hydrogen, C_1–C_4-alkyl, halogeno-C_1–C_4-alkyl, C_1–C_4-

alkoxy, C_1–C_4-alkylthio, halogen, trifluoromethyl, nitro and cyano;

R_4 is hydrogen, halogen, trifluoromethyl, C_1–C_4-alkyl, C_1–C_4-halogenoalkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, nitro or cyano, and

$B^{\oplus}$ is an ammonium group or an alkali cation.

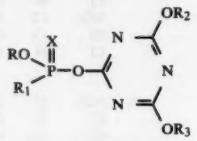
17. An insecticidal composition comprising about 5 to 95% by weight of an active agent as defined in claim **1** and about 95 to 5% by weight of liquid or solid carrier materials to which there may be added, upon corresponding reduction of the carrier materials, up to 20% by weight of surface active agents.

4,320,126
TRIAZINYL-ORGANOPHOSPHORUS ESTERS

Takayuki Okabe, Nishinomiya; Kunio Mukai, Takarazuka, and Masachika Hirano, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 27, 1979, Ser. No. 70,056
Claims priority, application Japan, Sep. 4, 1978, 53-108779
Int. Cl.³ C07D *251/34;* A01N *43/66*
U.S. Cl. 424—249 **8 Claims**

1. An organophosphorus ester of the formula,



wherein R is a C_1–C_2 alkyl group, R_1 is a C_1–C_2 alkyl, C_1–C_2 alkoxy, C_1–C_4 alkylamino, phenyl or phenoxy group, R_2 and R_3, which may be the same or different, are each a C_1–C_5 alkyl or methoxy C_2–C_3 alkyl group and X is an oxygen or sulfur atom.

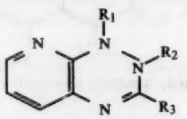
8. A method for controlling an insect, mite or nematode which comprises contacting the insect, mite or nematode with an insecticidally, acaricidally or nematocidally effective amount of a compound according to claim **1**.

4,320,127
PYRIDO[3,2-e]-AS-TRIAZINES

Pal Benko; Andras Messmer; György Hajos; Sandor Batori; Lujza Petocz; Iboly Kosoczky, and Peter Görög, all of Budapest, Hungary, assignors to Edyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

Filed May 23, 1980, Ser. No. 152,833
Claims priority, application Hungary, May 25, 1979, EE 2664
Int. Cl.³ A61K *31/53;* C07D *471/04*
U.S. Cl. 424—249 **5 Claims**

1. A pyrido[3,2-e]-as-triazine derivative of the formula I or a pharmaceutically acceptable acid addition salt thereof,



R_1 stands for a $C_{1\text{-}20}$ alkyl-carbonyl group, halogen-$C_{1\text{-}4}$ alkyl-carbonyl, benzoyl, phenyl-$C_{1\text{-}4}$ alkyl-carbonyl, or pyridyl-carbonyl group;

R_2 is a hydrogen atom or a $C_{1\text{-}4}$ alkyl-carbonyl group; or R_1 and R_2 form together with the adjacent nitrogen atoms a pyrazole-2,4-dione ring which carries a $C_{1\text{-}6}$ alkyl substituent in position 3;

R_3 is a hydrogen atom, a $C_{1\text{-}20}$ alkyl, phenyl, phenyl-$C_{1\text{-}3}$alkyl, furyl or pyridyl group or a phenyl group optionally substituted by one to three $C_{1\text{-}4}$ alkoxy-groups.

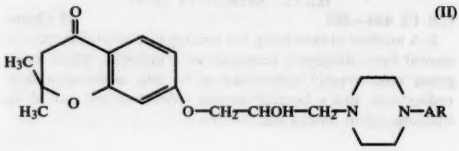
5. A pharmaceutical composition having sedative and antidepressive effects, containing as active agent a sedative and antidepressive effective amount of a compound of the formula I or a pharmaceutically acceptable acid addition salt thereof, wherein R_1, R_2 and R_3 are as defined in claim **1**, together with an appropriate inert, non-toxic, solid or liquid pharmaceutical carrier.

4,320,128
CHROMANONE DERIVATIVES AND COMPOSITIONS CONTAINING THEM

Charles S. Fake, Harlow, England, assignor to Beecham Group Limited, England

Filed Mar. 17, 1980, Ser. No. 131,236
Claims priority, application United Kingdom, Mar. 24, 1979, 10405/79; Feb. 9, 1980, 04407/80
Int. Cl.³ A61K *31/44;* C07D *405/12, 405/14*
U.S. Cl. 424—250 **6 Claims**

1. A compound of formula (II):



(II)

or a pharmaceutically acceptable acid-addition salt thereof wherein Ar is pyridyl or $—C_6H_3R_1R_2$ wherein R_1 is hydrogen, fluorine, chlorine, bromine, lower alkyl, lower alkoxyl, lower carboxylic acyl, lower carboxylic acyloxyl or lower alkoxycarbonyl; and R_2 is hydrogen, fluorine, chlorine, lower alkyl or lower alkoxyl.

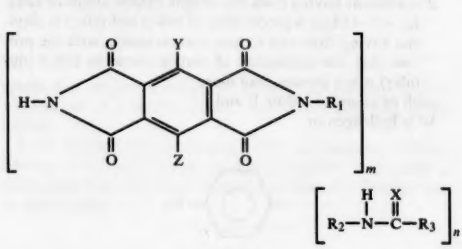
6. A method of treatment of hypertension, which method comprises administering to the sufferer an effective amount of a compound according to claim **1**.

4,320,129
PYROMELLITIC DIIMIDE COMPLEXES

Michael H. Fisher, and Bruce O. Linn, both of Bridgewater, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 5, 1979, Ser. No. 9,204
Int. Cl.³ C07D *239/20*
U.S. Cl. 424—251 **11 Claims**

1. A complex having the formula:



wherein

m and n are independently 1 or 2 such that m and n are not both 2;

R_1 is hydrogen, loweralkyl, or hydroxy substituted loweralkyl;

Y and Z are independently hydrogen, halogen or loweralkyl;

X is oxygen, sulfur or imino;

R_2 and R_3 are independently hydrogen, loweralkyl, amino, aminoloweralkyl or loweralkylamino; and

R_2 and R_3 may be connected to form a pyridyl or pyrimi-

dinyl ring which may be optionally substituted with lower-eralkyl or hydroxy.

4,320,130

BAIT COMPOSITIONS FOR THE CONTROL OF INSECTS PREPARED FROM PREGEL CORN AND A TOXICANT

Richard B. Balsley, Lebanon, and Abdel H. Marei, Mercerville, both of N.J., assignors to American Cyanamid Co., Stamford, Conn.

Filed Feb. 28, 1980, Ser. No. 125,595
Int. Cl.[3] A01N *25/00, 43/54*
U.S. Cl. 424—251 5 Claims

1. A stable, solid, free flowing, particulated insecticidal bait composition comprising: from 70% to 80% of pregel defatted corn grits, and from 20% to 30% of a solution wherein said solution comprises from 1% to 10% of tetrahydro-5,5-dimethyl-2-(1H)-pyrimidinone-{3-[4-(trifluoromethyl)phenyl]-1-{2-[4-(trifluoromethyl)phenyl]ethenyl}-2-propenylidene}hydrazone, in admixture with about 2% to 20% of oleic acid and soybean oil in amounts sufficient to total said solution to 100%, all percentages being by weight.

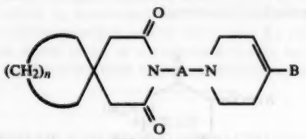
4,320,131

N-[(4-PHENY-1,2,3,6-TETRAHYDROPYRIDIN-1-YL)ALKYLENE]AZASPIROALKANEDIONES AND N-[(4-HYDROXY-4-PHENYLPIPERIDIN-1-YL)ALKYLENE]AZASPIROALKANEDIONES

Davis L. Temple, Jr., Evansville; Joseph P. Yevich, Newburgh, and Walter G. Lobeck, Jr., Evansville, all of Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Mar. 16, 1981, Ser. No. 244,426
Int. Cl.[3] A61K *31/445;* C07D *401/06*
U.S. Cl. 424—267 9 Claims

1. A compound selected from the group consisting of a compound having the formula (I)



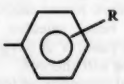
I

wherein

n is the integer 4 or 5;

A is a divalent straight alkylene chain of 2 to 5 carbon atoms inclusive;

B is



wherein R is hydrogen, lower alkyl from 1 to 4 carbon atoms inclusive, lower alkoxy of from 1 to 4 carbon atoms inclusive, or halogen;

and the non-toxic pharmaceutically acceptable acid addition salts thereof.

5. The process for eliciting a tranquilizer effect in a psychotic or neurotic mammal which comprises administering to said mammal a non-toxic effective tranquilizing dose of from 0.01 to 40 mg. per kg. of body weight of said mammal of a compound claimed in claim 1 by the oral or a parenteral route.

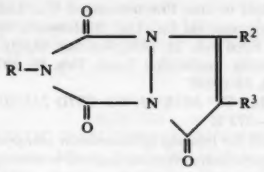
4,320,132

ANTIBOTRYTICAL PYRAZOLO-TRIAZOL-TRIONES

Mirella Cecere; Franco Gozzo; Simone Lorusso, and Carlo Garavaglia, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed May 9, 1980, Ser. No. 148,387
Claims priority, application Italy, May 11, 1979, 22553 A/79
Int. Cl.[3] A01N *43/90;* C07D *487/04*
U.S. Cl. 424—269 8 Claims

1. Pyrazolo-[1,2,a]-[1,2,4]-triazol-1,3,5-[2H]-triones having the general formula



in which

R^1 is lower alkyl, phenyl, phenyl substituted by lower alkyl, lower alkoxyl, trihalomethyl, NO_2 or halogen; and

R^2 and R^3, the same or different, are H or lower alkyl.

7. Method for preventing infections by *Botrytis cinerea* on useful plants, said method consisting in sprinkling the plants with the compounds of claim 1, either as such or in the form of compositions containing said compounds, in quantities of at least 0.75% upward.

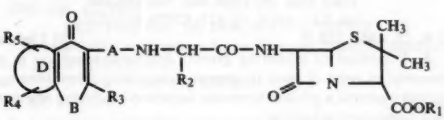
4,320,133

PENICILLINS AND THEIR ANTIBACTERIAL USE

Helmut Hamberger; Peter Stütz; Dieter Scholz, and Hans Fliri, all of Vienna, Austria, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 3,846, Jan. 16, 1979, abandoned. This application Feb. 6, 1980, Ser. No. 119,044
Claims priority, application Sweden, Jan. 16, 1978, 413/78
Int. Cl.[3] A61K *31/41, 31/43;* C07D *499/70*
U.S. Cl. 424—269 9 Claims

1. A compound of the formula



wherein

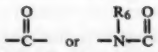
R_1 is hydrogen or pivaloyloxymethyl, and

R_2 is 4-hydroxyphenyl or 1,4-cyclohexadien-1-yl, and

R_3 is hydrogen, lower alkylthio, and

R_4 and R_5 independently represent hydrogen, lower alkyl, hydroxy, lower alkoxy, carboxyl, lower alkoxycarbonyl, lower alkoxycarbonylmethyl or halogen, and

A is the group



in which R_6 is hydrogen or lower alkyl, and

B is oxygen or sulphur, and

D is a 5- or 6-membered, unsaturated ring, which may contain one or more nitrogen, oxygen or sulphur group,

or a pharmaceutically acceptable salt thereof when R_1 is hydrogen.

9. A pharmaceutical composition which comprises an antibacterial effective amount of a compound of claim 1, or a

pharmacologically acceptable salt thereof, in association with a pharmacologically acceptable diluent or carrier.

4,320,134

INHIBITON OF THROMBOXANE SYNTHETASE WITH 1-SUBSTITUTED IMIDAZOLE COMPOUNDS

Kinji Iizuka; Kenji Akahane; Yukio Kamijo; Denichi Momose, all of Matsumoto, and Yukiyoshi Ajisawa, Okaya, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka and Kissei Pharmaceutical Co., Ltd., Matsumoto, both of, Japan

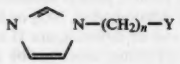
Filed Feb. 21, 1979, Ser. No. 14,001

Claims priority, application Japan, Feb. 18, 1978, 53-18054; Feb. 20, 1978, 53-18340

Int. Cl.³ A61K *31/415;* C07D *233/60*

U.S. Cl. 424—273 R 14 Claims

9. A method for treating inflammation comprising administering a therapeutically effective amount of a compound of the formula:



to a subject afflicted with the same, wherein Y is carboxyl, hydroxymethyl, N-di or -mono straight or branched chain C_1–C_4 alkyl substituted or unsubstituted carbamoyl, cyano or N-di or -mono straight or branched chain C_1–C_4 alkyl substituted or unsubstituted aminomethyl, and n is an integer of 3 to 20, or a pharmaceutically acceptable salt thereof.

4,320,135

INHIBITING GROWTH HORMONE SECRETION WITH 5,5-SUBSTITUTED HYDANTOIN DERIVATIVES

Faizulla G. Kathawala, Mountain Lakes, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

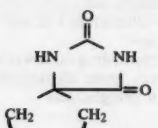
Filed May 19, 1980, Ser. No. 151,333

Int. Cl.³ A61K *31/415;* C07D *491/107*

U.S. Cl. 424—273 R 11 Claims

6. A method of inhibiting growth hormone secretion in a mammal in need of such treatment, comprising administering to said mammal a growth hormone secretion-inhibiting amount of a compound which is

(A) a free base of the formula:



wherein X is a divalent radical consisting of from 2 to 5 linked units; one unit being —O—, and from one to 4 units, independently, having the structure

$$-CH_2-\ (a);\ \text{or}\ -C(R)_2-\ (b)$$

in which R is alkyl having from 1 to 6 carbon atoms and being free of branching on the α-carbon atoms; or

(B) a pharmaceutically acceptable salt form thereof with a suitable cation.

4,320,136

8-AZA-16,16-DIFLUOROPROSTANOIDS

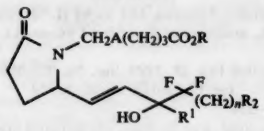
Richard M. Scribner, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 11, 1980, Ser. No. 176,784

Int. Cl.³ A61K *31/40;* C07D *207/27*

U.S. Cl. 424—274 37 Claims

1. A compound of the formula



wherein

A is CH=CH (cis or trans), C≡C, or CH_2CH_2;

R is H, C_1–C_{12} n-alkyl, branched chain alkyl, or cycloalkyl, or a physiologically acceptable metal or amine salt cation;

R^1 is H, CH_3, or C_2H_5;

R^2 is CH_3, CF_3, phenyl, or mono- or disubstituted phenyl, the phenyl substituents being selected from the group F, Cl, CH_3, OCH_3, NO_2, CF_3;

n is an integer from 3 to 8 when R^2 is CH_3 or CF_3, or from 0 to 2 when R^2 is phenyl or substituted phenyl;

said compound selected from the group consisting of

(i) a racemic mixture of stereo isomers,

(ii) an optically active mixture of stereo isomers, and

(iii) a single optically pure stereo isomer.

4,320,137

DERIVATIVES OF PERHYDRO-AZA-HETEROCYCLES

Romeo Paioni, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

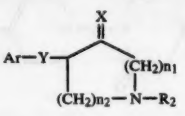
Division of Ser. No. 27,337, Apr. 5, 1979, Pat. No. 4,246,269, which is a division of Ser. No. 827,274, Aug. 24, 1977, Pat. No. 4,160,837. This application Sep. 28, 1980, Ser. No. 183,482

Claims priority, application Luxembourg, Sep. 1, 1976, 75701

Int. Cl.³ C07D *207/12;* A61K *31/40*

U.S. Cl. 424—274 16 Claims

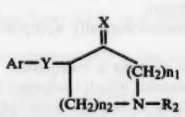
1. A compound of the formula



(I)

wherein X is hydrogen and the radical OR_1, in which R_1 is hydrogen, lower alkyl or an acyl group —C(=O)—R, in which R is lower alkyl, R_2 is hydrogen, lower alkyl, lower alkenyl or lower alkinyl, Ar is phenyl, naphthyl or 5,6,7,8-tetrahydronaphthyl, which are unsubstituted or mono- or disubstituted in an aromatic ring, at most two substituents being selected from lower alkyl, lower alkoxy and halogen, and at most one substituent being selected from trifluoromethyl, carbamoyl, nitro and cyano, Y is oxygen, n_1 and n_2 are each one, or an acid addition salt thereof.

12. A pharmaceutical composition for the treatment of mental depression comprising a therapeutically effective amount of a compound of the formula



(I)

wherein X is hydrogen and the radical OR_1, in which R_1 is

hydrogen, lower alkyl or an acyl group —C(=O)—R, in which R is lower alkyl, R_2 is hydrogen, lower alkyl, lower alkenyl or lower alkinyl, Ar is phenyl, naphthyl or 5,6,7,8-tetrahydronaphthyl which are unsubstituted or mono- or disubstituted in an aromatic ring, at most two substituents being selected from lower alkyl, lower alkoxy, and halogen, and at most one substituent being selected from trifluoromethyl, carbamoyl, nitro and cyano, said substituents being identical or different from one another, Y is oxygen, n_1 and n_2 are each one, or a pharmaceutically acceptable acid addition salt thereof together with a pharmaceutical excipient.

4,320,138

OXOTHIA COMPOUNDS

Raymond Bernasconi, Oberwil; Pier G. Ferrini, Binningen; Richard Göschke, Bottmingen, and Jacques Gosteli, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

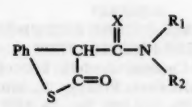
Continuation of Ser. No. 92,821, Nov. 9, 1979, Pat. No. 4,260,779, which is a continuation of Ser. No. 780,951, Mar. 24, 1977, abandoned. This application Dec. 8, 1980, Ser. No. 214,168

Claims priority, application Switzerland, Apr. 9, 1976, 4538/76; Dec. 20, 1976, 15994/76

Int. Cl.³ A61K *31/38*

U.S. Cl. 424—275 **10 Claims**

1. A peripheral analgesic, antiinflammatory uricosuric pharmaceutical preparation comprising a therapeutically effective amount of an oxothia compound of the formula



(I)

In which Ph represents 1,2-phenylene or 1,2-phenylene which is substituted by lower alkyl, lower alkoxy, halogen, trifluoromethyl and/or nitro, X represents oxygen or sulphur, R_1 represents lower alkyl, lower alkenyl, cycloalkyl, cycloalkenyl cycloalkyl-lower alkyl, phenyl-lower alkyl or phenyl-lower alkyl which is substituted in the phenyl part by lower alkyl, lower alkoxy, halogen, trifluoromethyl and/or nitro, phenyl or phenyl which is substituted by lower alkyl, lower alkoxy, halogen, trifluoromethyl and/or nitro, and R_2 represents hydrogen or lower alkyl, or a pharmaceutically acceptable salt thereof, in admixture with a pharmaceutical carrier.

4,320,139

METHOD OF ENHANCING THE ACTIVITY OF FAST EVAPORATING INSECTICIDES

Yasuharu Takei; Yasuharu Kodama; Hiroshi Shimoda, and Satoshi Ohi, all of Hiroshima, Japan, assignors to Fumakilla Limited, Tokyo, Japan

Continuation of Ser. No. 927,033, Jul. 24, 1978, abandoned. This application Feb. 8, 1980, Ser. No. 119,765

Claims priority, application Japan, Aug. 5, 1977, 52-093373

Int. Cl.³ A01N *37/00, 37/08, 43/16*

U.S. Cl. 424—282 **1 Claim**

1. A method for combating insects which comprises applying a fast evaporating insecticide to insects in an insecticidally effective amount, by evaporating said insecticide, by rapid heating of the said insecticide to a temperature between 150° C. and 400° C., said insecticide comprising a pyrethroid insecticide selected from the group consisting of allethrin, d-cis, trans-allethrin, d,d-allethrin, phenothrin, permethrin or resmethrin, at least one evaporation additive compound selected from the group consisting of dimethyl phthalate, diethyl phthalate, dibutyl phthalate, di-2-ethylhexyl phthalate, diisodecyl phthalate, dilauryl phthalate, dibenzyl phthalate, butyl oleate, butyl stearate, methyl myristate, isopropyl myristate, tributyl citrate, dibutyl maleate, acetylbutyl citrate, di-2- ethylhexyl adipate, diisodecyl adipate, di-2-ethylhexyl sebacate, dibenzyl sebacate, diiso-octyl sebacate, triiso-octyl trimellitate, butylphthalylbutyl glycolate, oleyl alcohol, lauryl alcohol, diethylene glycol, dipropylene glycol, diethylene glycol monobutyl ether, decane, undecane, and dipentene, and being present in an amount ranging from about 100% to about 320% by weight of said pyrethroid insecticide, and at least one antioxidant selected from the group consisting of dibutyl-hydroxy toluene, butylhydroxy anisole, n-propyl gallate, tocopherol, octadecyl-3- (3,5-ditertiarybutyl-4-hydroxyphenyl) propionate, pentaerythyltetrakis [3-(3,5-ditertiarybutyl-4-hydroxyphenyl)propionate], 2,5-ditertiarybutyl hydroquinone, 4,4'-thiobis(3-methyl-6-tertiarybutyl phenol), and 2,2'-methylene-bis-(4-methyl-6-tertiarybutyl phenol), said antioxidant being present in an amount ranging from about 5% to about 10% by weight of said pyrethroid insecticide.

4,320,140

SYNERGISTIC INSECTICIDAL COMPOSITIONS

Nathan N. Crounse, Myrtle Beach, S.C., and James R. Heitz, Starkville, Miss., assignors to Sterling Drug Inc., New York, N.Y.

Filed Oct. 9, 1980, Ser. No. 195,527

Int. Cl.³ A01N *43/16*

U.S. Cl. 424—283 **9 Claims**

1. A synergistic insecticidal composition effective against insects of the family Muscidae and of the family Culicidae which is a mixture consisting essentially of an insecticidally effective amount of at least one insecticide chosen from the group consisting of erythrosine and Rose Bengal in combination with a synergistically effective amount of an alkali metal salt of fluorescein in the range of approximately 0.3 to 1.0 part by weight of the latter per part by weight of said insecticide.

4,320,141

ANTITUMOR AGENT

Yasuhiro Komatsu, and Michiko Nagai, both of c/o Nisshin Flour Milling Co., Ltd. Central Research Institute, 177-3, Ohaza-Tsurugaoka, Ohi-machi, Iruma-gun, Saitama-ken, Japan

PCT No. PCT/JP78/00055, § 371 Date Aug. 16, 1979, § 102(e) Date Aug. 16, 1979, PCT Pub. No. WO79/00401, PCT Pub. Date Jul. 12, 1979

PCT Filed Dec. 14, 1978, Ser. No. 154,415

Claims priority, application Japan, Dec. 16, 1977, 52/150626; Dec. 29, 1977, 52/157630

Int. Cl.³ C07D *311/70*

U.S. Cl. 424—284 **2 Claims**

1. A method of treating tumors in patients, which comprises administering to said patients an antitumor composition containing, as active ingredient, an antitumor effective amount of an α-tocopherol vitamin A acid ester in a pharmaceutical carrier.

4,320,142

N-[(PHENYL(OXY OR AMINO))THIOACETYL]-1,2-DIAMINE ANTHROPODICIDES

Malcolm H. Black, 9 Longfield Gardens, Tring, Herts.; Alexander D. Frenkel, 13 New Rd., Aston Clinton, Bucks., and Peter T. Roberts, 66 Bridgewater Rd., Berkhamsted, Herts, all of England

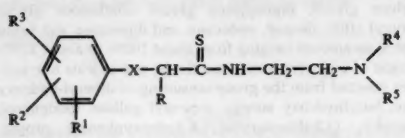
Filed May 15, 1980, Ser. No. 150,065

Claims priority, application United Kingdom, May 17, 1979, 17156/79; Feb. 28, 1980, 05886/80

Int. Cl.³ C07C *157/09, 155/02, 153/063;* A01N *47/30, 47/28, 47/10, 47/22, 47/40*

U.S. Cl. 424—300 **40 Claims**

1. A compound of formula (I):



(I)

wherein

R^1, R^2 and R^3 are the same or different and are selected from hydrogen, alkyl of 1 to 20 carbon atoms, alkoxy of 1 to 20 carbon atoms, halo, cyano and trifluoromethyl, or two of R^1, R^2 and R^3 are linked to form a 3 or 4 carbon atom group;

X is O or NA where A is hydrogen or alkyl of 1 to 20 carbon atoms:

R is hydrogen or alkyl of 1 to 20 carbon atoms;

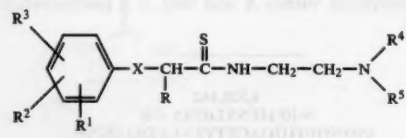
R^4 is hydrogen; unsubstituted or substituted alkyl of 1 to 20 carbon atoms where the substituents are selected from halo, hydroxy, cyano, alkoxy, phenoxy, naphthyloxy, alkylthio, phenylthio and naphthylthio; alkynyl, alkenyl or haloalkenyl of 3 to 20 carbon atoms saturated in the 1-position; or unsubstituted or substituted phenyl, phenylalkyl, naphthyl or naphthylalkyl where the substituents are selected from alkyl, alkoxy, halo, cyano and trifluoromethyl; and R^5 is a group

where B is O, S or NR^7 where R^7 is hydrogen, cyano, alkoxy, alkyl or substituted or unsubstituted phenyl, naphthyl, phenylalkyl or naphthylalkyl where the substituents are selected from alkyl, alkoxy, halo, cyano and trifluoromethyl; and

R^6 is hydrogen or a group R^8, OR^8, SR^8 or NR^9R^{10} where R^8 is alkyl, alkenyl, or substituted or unsubstituted phenyl, naphthyl, phenylalkyl, naphthylalkyl, phenoxyalkyl or naphthyloxyalkyl where the substituents are selected from alkyl, alkoxy, halo, cyano and trifluoromethyl; and R^9 and R^{10} are the same or different and are selected from hydrogen, alkyl and substituted or unsubstituted phenyl, naphthyl, phenylalkyl or naphthylalkyl where the substituents are selected from alkyl, alkoxy, halo, cyano and trifluoromethyl; or

an acid addition salt thereof when X is NA or B is NR^7.

16. An arthropodicidal formulation comprising an arthropodicidally effective amount of a compound of formula (I):



(I)

wherein

R^1, R^2 and R^3 are the same or different and are selected from hydrogen, alkyl, alkoxy, halo, cyano and trifluoromethyl or two of R^1, R^2 and R^3 are linked to form a 3 or 4 carbon atom group;

X is O or NA where A is hydrogen or alkyl;

R is hydrogen or alkyl;

R^4 is hydrogen; alkyl; substituted alkyl where the substituents are selected from halo, hydroxy, cyano, alkoxy, aryloxy, alkylthio and arylthio; alkynyl; alkenyl; haloalkenyl; aralkyl; aryl; or substituted aralkyl or aryl where the substituents are selected from alkyl, alkoxy, halo, cyano and trifluoromethyl; and

R^5 is a group

where B is O, S or NR^7 where R^7 is hydrogen, cyano, alkoxy, alkyl, aryl, aralkyl or substituted aryl or aralkyl where the substituents are selected from alkyl, alkoxy, halo, cyano and trifluoromethyl; and R^6 is hydrogen or a group R^8, OR^8, SR^8 or NR^9R^{10} where R^8 is alkyl, aryloxyalkyl, alkenyl, aralkyl, aryl or substituted aryl, aryloxyalkyl or aralkyl where the substituents are selected from alkyl, alkoxy, halo, cyano and trifluoromethyl; and R^9 and R^{10} are the same or different and are selected from hydrogen, alkyl, aralkyl, aryl and substituted aryl or aralkyl where the substituents are selected from alkyl, alkoxy, halo, cyano or trifluoromethyl; or an acid addition salt thereof when X is NA or B is NR^7 and a carrier therefor.

4,320,143

FLUORO-PROSTAGLANDINS AND PROCESS FOR THEIR PREPARATION

Renato Pellegata, and Carmelo Gandolfi, both of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

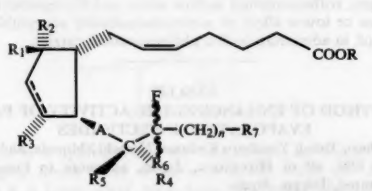
Continuation of Ser. No. 833,999, Sep. 16, 1977, abandoned, which is a division of Ser. No. 779,632, Mar. 21, 1977, abandoned, which is a continuation of Ser. No. 667,261, Mar. 15, 1976, abandoned. This application Feb. 2, 1979, Ser. No. 9,098

Claims priority, application Italy, Mar. 21, 1975, 21493 A/75

Int. Cl.[3] **C07C** *177/00*

U.S. Cl. 424—305 **13 Claims**

1. An optically active or racemic compound of the formula:



wherein:

R is a member selected from the group consisting of hydrogen, a C_1-C_{12} alkyl group and a cation of pharmaceutically acceptable base; the symbol ⁼⁼⁼ represents a single or a double bond, wherein, when the symbol ⁼⁼⁼ is a double bond, R_3 is a hydrogen atom and R_1 and R_2 together form an oxo group, while, when the symbol ⁼⁼⁼ is a single bond, R_3 is hydroxy, and one of R_1 and R_2, is hydrogen and the other is hydroxy or 'alkanoyloxy group containing up to 6 carbon atoms, a benzyloxy or a P-phenylbenzoyloxy group' or R_1 and R_2, taken together, form an oxo group;

A is —C≡C—;

one of R_4 and R_5 is hydroxy and the other is hydrogen;

R_6 is a member selected from the group consisting of hydrogen, methyl and fluorine;

n is zero, or an integer of 1 to 6;

R_7 is cycloalkyl containing 3 to 7 ring carbon atoms.

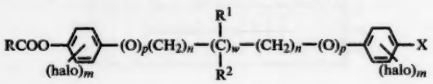
4,320,144

FUNGICIDAL USE OF DIPHENYL ESTERS OF ALKYLENES

Bruce M. Resnick, West Paterson, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Apr. 3, 1981, Ser. No. 250,469
Int. Cl.³ A01N *37/02, 37/06*
U.S. Cl. 424—311 8 Claims

1. A method of inhibiting growth of fungi which comprises exposing said fungi to a growth inhibiting quantity of a diphenyl ester having the formula:



wherein halo is fluorine, chlorine or bromine; R is a radical having not more than 4 carbon atoms, selected from the group consisting of alkenyl, halogenated alkenyl and halogenated alkyl; X is hydroxy or the radical RCOO—; R^1 and R^2 are each independently hydrogen or methyl; m has a value of from 0 to 2; n has a value of from 0 to 6; w and p each have a value of 0 or 1, except that w is 1 when n is zero or a mixture of said esters.

4,320,145

PHARMACEUTICAL COMPOSITION FOR PARENTERAL NUTRITION COMPRISING L-CARNITINE OR ACYL L-CARNITINES

Claudio Cavazza, 47, Viale Shakespeare, 00144 Rome, Italy

Filed Sep. 29, 1980, Ser. No. 191,959
Claims priority, application Italy, Oct. 5, 1979, 50467 A/79
Int. Cl.³ A61K *31/205, 31/195*
U.S. Cl. 424—316 10 Claims

1. A parenterally administrable pharmaceutical composition useful for nourishing patients who cannot be fed via the enteral route, consisting essentially a nutritionally effective amount of glucose, an amount of L-carnitine or acyl-L-carnitine wherein the acyl group has 2–6 carbon atoms, or a pharmaceutically acceptable salt, ester or amide thereof, sufficient to enhance glucose utilization whilst avoiding excessive insulin secretion in said patients, said L-carnitine or acyl-L-carnitine being solely the L-isomer or a mixture of the L- and D-isomers in an L:D ratio of at least 95:5; and a pharmaceutically acceptable liquid excipient therefor.

4,320,146

TREATMENT OF HEPATIC AND RENAL DISORDERS WITH ORNITHINE AND ARGININE SALTS OF BRANCHED CHAIN KETO ACIDS

Mackenzie Walser, Ruxton, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Division of Ser. No. 887,570, Mar. 17, 1978, Pat. No. 4,228,099.
This application Oct. 2, 1980, Ser. No. 193,516
Int. Cl.³ A61K *31/22, 31/195*
U.S. Cl. 424—319 13 Claims

1. A composition for promoting protein synthesis by improving nitrogen balance in subjects with liver disease comprising a carrier and an effective amount of at least one compound having the formula:

$$AK.xH_2O$$

wherein A is selected from the group consisting of arginine and ornithine, K is an alpha keto analog of a branched chain essential amino acid, and x varies from zero to about one.

4,320,147

DISINFECTANT COMPOSITION AND THE USE THEREOF

Peter J. Schaeufele, Ringwood, N.J., assignor to Lonza Inc., Fair Lawn, N.J.

Filed May 9, 1980, Ser. No. 148,395
Int. Cl.³ A01N *33/12*
U.S. Cl. 424—329 6 Claims

1. A disinfectant composition useful in hard water which comprises an aqueous solution of from 800 to 1000 ppm of active ingredients, said active ingredients being from 20 to 80 wt. % of alkyl dimethyl benzyl ammonium chloride, wherein said alkyl chain has from 12 to 16 carbon atoms, and from 80 to 20 wt. % of a mixture of octyl decyl, dioctyl and didecyl dimethyl ammonium chloride.

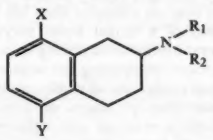
4,320,148

2-AMINOTETRALIN COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND METHOD OF PRODUCING CENTRAL ALPHA$_1$ AGONIST ACTIVITY

Robert M. DeMarinis, Ardmore, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Nov. 24, 1980, Ser. No. 210,470
Int. Cl.³ A01N *33/02;* C07C *87/64;* A61K *31/135*
U.S. Cl. 424—330 16 Claims

1. A compound of the formula:



in which:

R_1 and R_2 are each hydrogen or lower alkyl having 1 to 3 carbon atoms;

X is methoxy and Y is methylthio, ethylthio, phenylthio, trifluoromethylthio or amino; or

Y is methoxy and X is methylthio, ethylthio, phenylthio, trifluoromethylthio or amino;

or a pharmaceutically acceptable acid addition salt thereof.

14. A method of producing alpha$_1$ agonist activity which comprises administering to an animal requiring said treatment an amount sufficient to produce said activity of a chemical compound as defined in claim 1.

4,320,149

USE OF FLUORINATED BETA-DIKETONES AS ANTIPLAQUE AGENTS

Michael R. Engel, White Bear Lake, and Linda L. Aasen, Lakeland, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 84,989, Oct. 15, 1979, abandoned. This application May 1, 1981, Ser. No. 259,700
Int. Cl.³ A61K *31/12;* A01N *35/00*
U.S. Cl. 424—331 3 Claims

1. The process of inhibiting the growth of *Streptococcus mutans* bacteria in the oral cavity which comprises providing in the environment of said bacteria a growth inhibiting amount of a beta-diketone compound represented by the formula

$$Y—CO—CH_2—CO—R_f$$

wherein Y is selected from the group consisting of an alkyl group having 4 to 20 carbon atoms, an alkenyl group having 4 to 20 carbon atoms, a halogen-substituted alkyl group having 4 to 20 carbon atoms, a halogen-substituted alkenyl group having 4 to 20 carbon atoms, phenyl or naphthyl and their halo-

gen-substituted derivatives, and R_f is a perfluoroalkyl group containing one to three carbon atoms.

4,320,150

LACTOSE-RICH ANIMAL FEED FORMULATIONS AND METHOD OF FEEDING ANIMALS

Paul R. Austin, Wilmington; John P. Zikakis, Townsend, both of Del., and Charles J. Brine, Skillman, N.J., assignors to University of Delaware, Newark, Del.

Continuation-in-part of Ser. No. 51,850, Jun. 25, 1979, abandoned. This application Dec. 12, 1980, Ser. No. 216,027

Int. Cl.³ A23C *21/08;* A23K *1/08, 1/18*

U.S. Cl. 426—2 **10 Claims**

1. An animal feed, formulated for feeding farm type animals containing a lactose-rich whey product in an amount that exceeds the normal digestive tolerance limit for lactose for the farm type animal to be fed and 0.5 to 5% by weight of the feed of a water insoluble poly-N-acetyl-β-D-glucosamine glycoside.

4,320,151

ANTISTALING BAKING COMPOSITION

Morton S. Cole, 2506 Ivy La., Decatur, Ill. 62521

Continuation-in-part of Ser. No. 693,356, Jun. 7, 1976, abandoned. This application Dec. 20, 1977, Ser. No. 862,653

Int. Cl.³ A21D *2/08*

U.S. Cl. 426—18 **11 Claims**

1. A process of making a bakery product having improved softness retention over an extended shelf life period resulting from incorporation of a fungal alpha amylase preparation resistant to temperatures incurred during baking and an edible emulsifier, said process comprising the steps of:

a. mixing a dough containing an edible emulsifier taken from the group consisting of mono- or dilycerides, diacetyl tartaric acid esters or mono- and diglycerides, propylene glycol esters of mono- and diglycerides, ethoxylated monoglycerides, succinylated monoglycerides, polysorbate 60, calcium stearoyl-2-lactylate, sodium stearoyl-2-lactylate, lactylic esters of fatty acids and mixtures of two or more of the above;

b. preparing a fungal alpha amylase enzyme stabilized against thermal denaturation by dispersion in a concentrated aqueous solution of essentially mono- and disaccharides taken from the group consisting of dextrose, fructose, sucrose, invert syrup, corn syrups, high fructose corn syrup and mixtures of two or more of the above; said mono- and disaccharides being present in a concentration of between 50 and 80% based on the weight of the solution; said solution containing fungal alpha amylase enzyme in intimate solution with the mono- and disaccharides to provide between 10 and 400 SKB units of fungal alpha amylase activity per 100 g. of flour in a bakery formulation, said dispersion enabling fungal alpha amylase enzyme activity to be retained in the temperature range of 170°–180° F. (76°–82° C.); and

c. adding said sugar dispersion of fungal alpha amylase to said formed dough in such manner that the protective enzyme solution remains subsatantially undiluted during subsequent dough mixing, handling and baking whereby said mono- and disaccharides form a protective medium which continues to protect the enzyme after its incorporation in the dough.

11. An additive for starch-containing bakery products which are processed to achieve a minimum internal temperature of 160° F., said additive comprising a fungal alpha amylase enzyme which normally is substantially completely inactivated in a temperature range of 167°–176° F. and protective means mixed with said enzyme in proportions which extend the activity of said enzyme into the temperature range of 170°–180° F. and which terminates the activity of said enzyme at a temperature of 190° F., said protective means comprising a concentrated solution containing 50–80% of a sugar taken from the group consisting of dextrose, fructose, sucrose, invert syrup, corn syrups, high fructose corn syrup and mixtures of two or more of the above; said concentrated solution containing fungal alpha amylase enzyme in the range of 10 to 400 units (SKB) of activity per 100 g. of cereal or cereal flour component of said food, and an edible emulsifier taken from the group consisting of mono- or diglycerides diacetyl tartaric acid esters of mono- and diglycerides, propylene glycol esters of mono- and diglycerides, ethoxylated monoglycerides, succinylated monoglycerides, polysorbate 60, calcium stearoyl-2-lactylate, sodium stearoyl-2-lactylate, lactylic esters of fatty acids and mixtures of two or more of the above.

4,320,152

PROCESS FOR PREPARING A MINCED MEAT PRODUCT

Maurice Fradin, Saint Jean de Monts, France, assignor to Chiron S.A., Saint Jean de Monts, France

Filed Apr. 3, 1979, Ser. No. 26,641

Claims priority, application France, Apr. 5, 1978, 78 10157

Int. Cl.³ A23L *1/01, 1/31*

U.S. Cl. 426—618 **5 Claims**

1. A process for the preparation of a food product suitable for grilling, roasting or frying which comprises preparing a pasty composition by wetting a flour, middling, semolina, concentrate or isolated constituent of a cereal, leguminous plant or protide-containing substance with milk, cooling this composition to a temperature not exceeding about 0° C., subsequently mixing the cooled composition at a temperature below about 0° C. with raw meat in a mincing machine, and subsequently refrigerating or deep-freezing the product.

4,320,153

METHOD FOR PRODUCING REFRIGERATED GROUND FLESH OF FISH OF HIGH ELASTICITY

Ryuzo Ueno, Nishinomiya; Tatsuo Kanayama; Toshio Matsuda, both of Itami; Kunihiko Tomiyasu, Nishinomiya, and Shigeo Inamine, Kobe, all of Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

Continuation of Ser. No. 6,366, Jan. 25, 1979, abandoned. This application Mar. 31, 1980, Ser. No. 136,165

Claims priority, application Japan, Mar. 8, 1978, 53-25520

Int. Cl.³ A23L *1/272, 1/325*

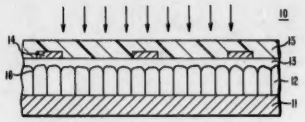
U.S. Cl. 426—643 **14 Claims**

1. A method for producing a refrigerated ground flesh of fish, of high elasticity, which comprises mixing the ground flesh of fish with (1) 1 to 10%, based on the weight of the ground flesh, of a powdery or granular solid colloid having a particle size of smaller than 16 mesh, consisting essentially of 70 to 99% by weight of a crystallized and stabilized solid sugar alcohol and 30 to 1% by weight of fine particles of an edible vegetable or animal oil or fat dispersed in it, wherein the oil or fat is dispersed by adding said oil or fat to said sugar alcohol or an aqueous solution of said sugar alcohol while stirring said sugar alcohol or aqueous solution of said sugar alcohol to form a dispersion and wherein said colloid is obtained by cooling said dispersion of liquid fine particles of said oil or fat in either said sugar alcohol or said aqueous solution of said sugar alcohol and adding a seed crystal to solidify and crystallize the sugar alcohol, and pulverizng the crystallized solid colloid, and (2) 0.1 to 0.5%, based on the weight of the ground flesh, of a powdery or granular polyphosphate, in amounts sufficient to improve the elasticity of said fish flesh, and then refrigerating the mixture.

4,320,154
METHOD OF FORMING SOLAR CELLS BY GRID CONTACT ISOLATION

William J. Biter, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 18, 1980, Ser. No. 171,930
Int. Cl.[3] H01L *35/34, 31/04*
U.S. Cl. 427—75 8 Claims

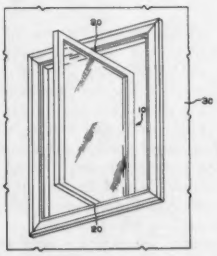


1. A method of making a gridded, high output solar cell structure, comprising the steps:
(1) providing a thin film cell, comprising a top layer of cuprous sulfide formed on a base of cadmium sulfide, and having an applied metallic grid on the surface of the cuprous sulfide,
(2) baking the gridded cell for between 20 minutes and 10 hours at between 200° C. and 300° C., to form a CdS:Cu electrically insulating, high resistance region within the cadmium sulfide base,
(3) removing the cuprous sulfide layer not covered by the metallic grid,
(4) removing the CdS:Cu region not covered by the metallic grid, to provide bare cadmium sulfide areas, and
(5) forming a layer of cuprous sulfide on all areas not covered by the metallic grid.

4,320,155
METHOD FOR COATING AN ARTICLE TO ALTERNATELY REFLECT AND ABSORB SOLAR ENERGY

F. Howard Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 866,448, Jan. 3, 1978, Pat. No. 4,235,048.
This application Jul. 28, 1980, Ser. No. 172,612
Int. Cl.[3] C23C *13/02;* B05D *1/36*
U.S. Cl. 427—160 5 Claims



1. A method for making a coated article for alternately reflecting and absorbing incident solar energy comprising the steps of:
a. placing a transparent substrate in an air-tight coating chamber;
b. evacuating said chamber to less than 5×10^{-4} Torr;
c. evaporating and condensing to form a film, in sequence, the following materials:
(1) a reflective metal;
(2) an absorptive material selected from the group consisting of semiconducting materials with an absorption edge in the range of about 1 to 4 microns; and
(3) an antireflective material selected from the group consisting of silicon oxides, aluminum oxides, and magnesium fluoride.

4,320,156
INTIMATE MIXTURES OF REFRACTORY METAL CARBIDES AND A BINDER METAL

James J. Oakes, Murfreesboro, Tenn., and William Scheithauer, Jr., Sayre, Pa., assignors to GTE Products Corporation, Stamford, Conn.

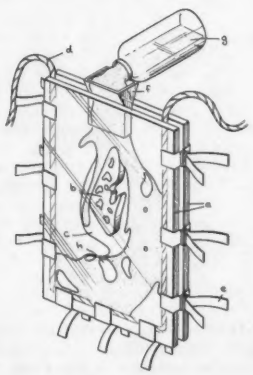
Filed Jan. 12, 1981, Ser. No. 224,368
Int. Cl.[3] F16H *13/10*
U.S. Cl. 427—213 2 Claims

2. A process for producing a relatively homogeneous mixture of a refractory metal carbide and a binder metal comprising the steps of: (1) introducing a nonhomogeneous mixture consisting essentially of particles of said refractory metal carbide particles of said binder metal into a confined chamber to form a bed; (2) directing a stream of a gas to said refractory metal carbide and said binder metal through said bed at a sufficient velocity to maintain said bed in a fluidized turbulent state without an appreciable entrainment of the particles in said gas as said gas exits from said bed; (3) maintaining said bed in a fluidized condition for at least about 10 minutes; and (4) spraying a sufficient amount of an aqueous solution of a pressing aid onto said bed while in a fluidized state to achieve a concentration of pressing aid of from about 1.5% to about 4.5% by weight of said homogeneous mixture, and (5) maintaining said bed in a fluidized state for at least about 20 minutes after all of said solution has been added to said bed.

4,320,157
METHOD FOR PRESERVING LARGE SECTIONS OF BIOLOGICAL TISSUE WITH POLYMERS

Gunther von Hagens, Jahnstrasse 8, Heidelberg, Fed. Rep. of Germany (D-6900)

Filed Aug. 8, 1980, Ser. No. 176,350
Int. Cl.[3] A47G *1/12;* B29D *3/00*
U.S. Cl. 428—13 19 Claims



1. A method of converting a cut section of biological tissue into an examinable plastinated sheet in which the tissue is permanently preserved, said method comprising the steps of:
A pretreating the cut section to render it suitable for impregnation;
B impregnating the pretreated section with a fluid precursor composition;
C compressing the impregnated section between parallel plates having smooth inner surfaces whereby the opposing cut surfaces of the section abut the inner surfaces of the plates, the plates being separated by a compressible gasket

to define a flat cell having a vacant region therein adjacent the periphery of the section;

D filling the flat cell with a fluid precursor composition which occupies said vacant region;

E curing the fluid precursor composition in said cell in a manner avoiding the formation of boundary lines, the resultant shrinkage causing the compressed plates of said cell to move toward each other to form a sheet therein which is of substantially uniform thickness and has smooth surfaces; and

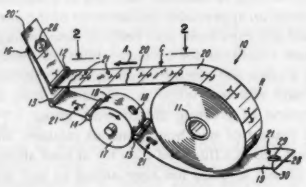
F removing said plates to release said sheet.

4,320,158

COMPOSITE LABEL WEB ROLL

William J. Seeley, Bellbrook, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed May 30, 1980, Ser. No. 154,679
Int. Cl.³ B32B *3/10, 3/16*
U.S. Cl. 428—42 **7 Claims**



1. A composite label web for use in a label dispensing apparatus, the composite web comprising: a carrier web of supporting material, a series of labels releasably adhered by pressure sensitive adhesive to the carrier web, the composite web being wound into a roll having an outer free end, longitudinally spaced groups of cuts in the carrier web, each group of cuts including a first pair of lateral cuts converging toward a first point and away from the outer free end of the roll, a second pair of lateral cuts spaced longitudinally from the first pair of cuts and converging toward a second point and away from the outer free end of the roll and a longitudinal cut extending between the first and second points, the first and second pairs of cuts and the longitudinal cut defining a flap projecting longitudinally in a trailing direction away from the outer free end of the roll and a pair of laterally disposed flaps, the pressure sensitive adhesive adhering the labels lightly to the carrier web to enable labels to be delaminated from the carrier web when the carrier web is drawn from the roll about a sharp angle, the carrier web at each group of cuts being engageable by a toothed driver which can enter the web by folding the laterally disposed flaps out of the plane of the carrier web and by folding the longitudinally projecting flap out of the plane of the carrier web and drivingly engaging the driver with the longitudinally projecting flap.

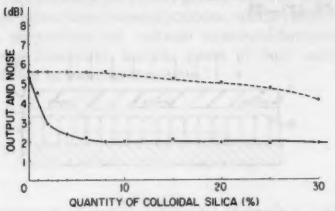
4,320,159

MAGNETIC RECORDING MEDIUM

Hiroshi Ogawa; Hiromi Nakahara, and Yasuo Tamai, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 918,819, Jun. 26, 1978, abandoned. This application Feb. 8, 1980, Ser. No. 119,970
Int. Cl.³ B32B *3/02*
U.S. Cl. 428—64 **10 Claims**

1. In a magnetic recording medium comprising a magnetic layer supported on a non-magnetic support and wherein the magnetic layer comprises a ferromagnetic fine powder, a binder and a colloidal silica, the improvement comprising employing as the magnetic layer, a composition prepared by dispersing the ferromagnetic fine powder in from 10 to 400 parts by weight, per 100 parts by weight of the ferromagnetic fine powder, of the binder while simultaneously adding thereto 2 to 20 parts by weight, based on 100 parts by weight of the ferromagnetic powder, of a colloidal silica having a diameter of 7 to 50 mμ and methyl groups on the surface thereof and which is prepared by treating a colloidal silica having silanol groups on the surface thereof with methanol, trimethylmonochlorosilane or dimethyldichlorosilane to replace at least 70% of the silanol groups with methyl groups; the ferromagnetic fine powder being one in which the ferromagnetic metal consists essentially of at least one metal selected from the group consisting of Fe, Co, Ni, Fe-Co, Fe-Ni, Co-Ni and Fe-Co-Ni.

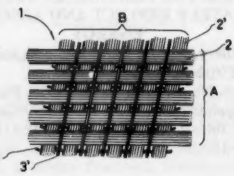


4,320,160

FABRIC STRUCTURE FOR FIBER REINFORCED PLASTICS

Akira Nishimura, Ohtsu, and Kyuichiro Nishimura, Shiga, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 68,422, Aug. 21, 1979, abandoned. This application Sep. 30, 1980, Ser. No. 192,548
Int. Cl.³ B32B *5/12;* **D04H** *3/04;* **D03D** *15/00*
U.S. Cl. 428—107 **21 Claims**



1. A reinforcing fibrous structure for use in fiber reinforced plastics, which comprises (a) a yarn group A composed of a plurality of straight reinforcing filamentary yarns of carbon fibers gathered in one direction in parallel to one another in the form resembling a sheet, (b) a yarn group B composed of a plurality of straight reinforcing filamentary yarns of carbon fibers gathered in one direction in parallel to one another in the form resembling a sheet, the sheet face of the yarn group B confronting the sheet face of the yarn group A and the reinforcing filamentary yarns of the yarn group B intersecting the reinforcing filamentary yarns of the yarn group A, and (c) auxiliary filamentary yarns which hold integrally said yarn groups A and B, said auxiliary filamentary yarns having a higher elongation at break than those of the reinforcing filamentary yarns of both the yarn groups A and B wherein the shrinkage at 120° C. of the auxiliary filamentary yarns is not more than 2 percent and the cross-sectional area of the reinforcing filamentary yarns is at least 3 times the cross-sectional area of the auxiliary filamentary yarns.

4. A reinforcing fibrous structure for use in fiber reinforced plastics, which comprises (a) a yarn group A composed of a plurality of straight reinforcing filamentary yarns of carbon fibers gathered in one direction parallel to one another in the form resembling a sheet, (b) a yarn group B composed of a plurality of straight reinforcing filamentary yarns of carbon fibers gathered in one direction in parallel to one another in the

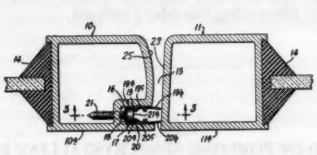
form resembling a sheet, the sheet face of the yarn group B confronting the sheet face of the yarn group A and the reinforcing filamentary yarns of yarn group B intersecting the reinforcing filamentary yarns of yarn group A, and (c) auxiliary filamentary yarns which hold integrally said yarn groups A and B; said auxiliary filamentary yarns having an elongation at break of at least two times the elongation at break of the reinforcing filamentary yarns of both the yarn groups A and B, and shrinkage of not more than 2 percent at 120° C.; said reinforcing filamentary yarns having a rigidity of at least five times the rigidity of the auxiliary filamentary yarns and a cross-sectional area of at least three times the cross-sectional area of the auxiliary filamentary yarns.

4,320,161

WEATHER STRIPPING MATERIAL

Ronald E. Redman, Niles, Mich., assignor to Kawneer Company, Inc., Niles, Mich.

Filed Sep. 13, 1979, Ser. No. 75,272
Int. Cl.³ E06B *7/16*
U.S. Cl. 428—122 **13 Claims**



1. A weather stripping material comprising an elongated strip of substantially U-shaped cross section having a base and two spaced apart legs joining said base throughout their lengths and extending away from said base throughout their widths, said legs each having a base leg portion and an extended wiper portion formed of a flexible plastic material which is joined to the companion base leg portion throughout its length, each of said wiper portions being adapted to wipe against an adjacent structural surface at its outer edge and to engage said surface throughout its length to provide a weather seal between the engaged edge and structural surface, said base adapted to receive the shanks of fasteners extended therethrough at spaced intervals for supportively attaching said weather stripping material to a door or the like, at least one of said legs having an inwardly directed ridge along the length thereof on an inside surface facing the opposite leg in parallel spaced relation to said base forming a channel shaped recess for accommodating the head of said fasteners, said base and said ridge engageable with opposite surfaces of said heads for moving said base toward and away from said door in response to movement of the shank of said fasteners relative to said door to adjust the position of said weather stripping material on said door.

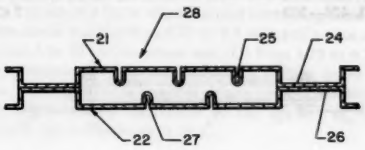
4,320,162

MULTI-PLY FIBROUS SHEET STRUCTURE AND ITS MANUFACTURE

Galyn A. Schulz, Appleton, Wis., assignor to American Can Company, Greenwich, Conn.

Filed May 15, 1980, Ser. No. 149,913
Int. Cl.³ B32B *3/28, 29/00*
U.S. Cl. 428—154 **18 Claims**

1. Multi-ply fibrous sheet structure, comprising: a pair of fibrous webs forming the plies with inner surfaces facing each other, each web having a first pattern of embossments of a first uniform depth comprising land and recess areas on said inner surfaces of said web, and a second pattern of embossments surrounding said first pattern, being of a second uniform depth less than the first, comprising land and recess areas on said inner surfaces of said webs; adhesive means joining distal portions of said land areas of said first pattern on one of said webs



to the facing, other one of said webs; and distal portions of said land areas of said second pattern of embossments that surround said land areas of said second pattern of embossments on each of said webs being non-joined to the facing web.

4,320,163

THREE-DIMENSIONAL CEILING BOARD FACING

William C. Schwartz, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Dec. 17, 1979, Ser. No. 104,145
Int. Cl.³ B05D *5/00, 3/02;* B32B *3/10, 5/20*
U.S. Cl. 428—158 **10 Claims**

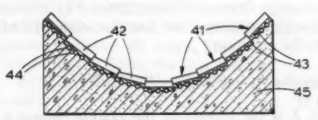
10. A decorative acoustical wall or ceiling surfacing fabric comprising a fibrous glass fabric having had foamable printing paste printed on one side thereof in a discontinuous predetermined architectural pattern, the foamable printing paste having been expanded and cured.

4,320,164

MIRROR COMPOSITE ELEMENTS

Maurice Nicolas, Maurepas, and Eugene Bacconnet, Marcoussis, both of France, assignors to Commissariat a l'Energie Atomique and Bfg Glassgroup, both of Paris, France

Division of Ser. No. 956,043, Oct. 31, 1978, Pat. No. 4,241,126.
This application Aug. 8, 1980, Ser. No. 176,566
Claims priority, application Luxembourg, Nov. 17, 1977, 78535
Int. Cl.³ B32B *3/30;* B29C *5/00*
U.S. Cl. 428—167 **14 Claims**

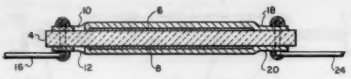


1. A composite mirror comprising a plurality of mirror sheet members rigidly secured with their rear main faces in contact with a surface of a concrete rigid support structure, the mirror sheet members being arranged in faceted manner to face in a plurality of predetermined directions, and comprising one or more members secured to the rear main faces of the mirror sheet members and embedded in the support structure to provide a key therefor.

4,320,165
THICK FILM RESISTOR

Michael J. Cash, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 15, 1978, Ser. No. 960,873
Int. Cl.³ B32B 7/02; B05D 5/12; H01C 1/012
U.S. Cl. 428—213 7 Claims

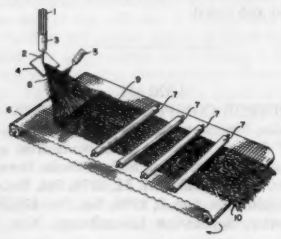


1. A unitary thick film resistor structure comprising:
a non-conductive substrate member;
a first thick film resistor element formed on a first major face of said substrate member;
a second thick film resistor element formed on a second major face of said substrate member;
said first thick film resistor element having a slightly positive temperature coefficient of resistance;
said second thick film resistor element having a slightly negative temperature coefficient of resistance; and
means connecting said first and second thick film resistor elements in parallel to form a unitary structure wherein said positive and negative temperature coefficients provide mutual compensation and effectively sum to substantially approach zero.

4,320,166
THERMAL-INSULATING NONWOVEN BULKY PRODUCT

Tadakazu Endo, Ohtsu; Hirotsugu Suzuki, Tokyo, and Masanori Takahashi, Kyoto, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 2, 1980, Ser. No. 146,078
Int. Cl.³ B32B 5/16
U.S. Cl. 428—283 23 Claims



1. A thermal insulating nonwoven bulky product comprising a multiplicity of substantially continuous single filaments having an average fineness of from about 0.01 to about 2 deniers, and a specific volume of not less than about 40 ml/g as calculated by the equation

$$\text{Specific volume (ml/g)} = (20 \times 20 \times h)/A$$

wherein A is the weight of the sample having a length and width of 20 cm and 20 cm, respectively, and h is the average height of the sample measured under the load of 0.125 g/cm^2; said filaments having random crimps in the range of from about 1 to about 20% as calculated by the equation

$$\text{percentage crimp (\%)} = ((l_1 - l_0)/l_1) \times 100$$

wherein l_0 is the distance between arbitrarily chosen points in the filament measured under the load of 2 mg/d, and l_1 is the distance between the same points measured under the load of 300 mg/d; said filaments being stabilized together and in layers by a surface binder of low molecular weight on the filaments in the range of from about 0.5 to about 20% by weight of the filaments.

4,320,167
NONWOVEN FABRIC AND METHOD OF PRODUCTION THEREOF

Marvin Wishman, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

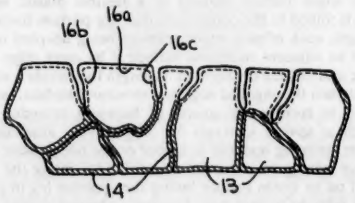
Filed Nov. 19, 1979, Ser. No. 94,261
Int. Cl.³ B29D 27/00; D04H 18/00
U.S. Cl. 428—288 60 Claims

53. A nonwoven textile fabric comprising:
a needled and drawn batt comprising intermixed acrylic fibers and additional fibers selected from the group consisting of polyester fibers, nylon fibers and mixtures of polyester fibers and nylon fibers; and at least a portion of said additional fibers being selectively fused and said acrylic fibers being essentially unfused.

4,320,168
METHOD OF FORMING SEMICRYSTALLINE SILICON ARTICLE AND PRODUCT PRODUCED THEREBY

Joseph Lindmayer, Bethesda, Md., assignor to Solarex Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 916,545, Jun. 19, 1978, Pat. No. 4,213,259, Ser. No. 751,342, Dec. 16, 1976, abandoned, and Ser. No. 751,343, Dec. 16, 1976. This application Dec. 11, 1978, Ser. No. 968,039
Int. Cl.³ H01L 21/306
U.S. Cl. 428—332 10 Claims



1. A method of making a photovoltaic cell from a wafer of semicrystalline silicon having a surface adapted for the impingement of light thereon, said surface being formed from individual grains of silicon having a mean diameter of at least about 100 microns and grain boundaries that at said surface are in contact with or separated only slightly from the boundaries of adjoining grains and in which boundaries impurities and crystallographic defects are concentrated, comprising subjecting said impingement surface to etching that will preferentially attack said grain boundaries as compared with the interiors of said grains until at least a substantial portion of the grain boundaries at said surface have been removed and grooves have been formed in said surface between said adjoining grains thereat, and then forming a photovoltaic junction inwardly of said impingement surface of said wafer.

8. A wafer formed from grains of semicrystalline silicon and suitable for being made into a photovoltaic cell, said wafer being produced by the practice of any of the methods of claims 1, 5 or 6.

4,320,169

HEAT WAVE-REFLECTIVE OR ELECTRICALLY CONDUCTIVE LAMINATED STRUCTURE

Toshiaki Yatabe; Nobuo Suzuki, both of Hino, and Ikuto Sugiyama, Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 29, 1980, Ser. No. 182,612

Claims priority, application Japan, Aug. 31, 1979, 54-111430; Sep. 14, 1979, 54-117237

Int. Cl.³ B32B *7/02, 27/36, 15/04*

U.S. Cl. 428—333 **7 Claims**

1. In a heat wave-reflective or electrically conductive laminated structure composed of

(A) a shaped solid substrate,

(B) a transparent thin layer having a high refractive index of at least 1.6 with respect to visible light in contact with one or both surfaces of a layer (C) below, wherein when the layer (B) is provided on both surfaces of the layer (C), it can, at one surface, be a transparent thin layer (B) whose refractive index is lower than that of 1.6 with respect to visible light,

(C) a transparent heat wave-reflective thin layer of an electrically conductive metal in contact with the substrate (A) or with the transparent thin layer (B), and wherein the laminated structure can also contain the following layer:

(D) a transparent top layer;

the improvement wherein said layer (C) is a layer composed of at least about 50% by weight of Ag, about 3 to about 30% by weight of Au and about 0.5 to about 30% of Cu, the amounts being based on the total weight of Ag, Au and Cu.

4,320,170

POLYURETHANE RIBBON FOR NON-IMPACT PRINTING

Hugh T. Findlay, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1980, Ser. No. 213,984

Int. Cl.³ B32B *9/04;* **B41J** *31/00;* **B32B** *27/40*

U.S. Cl. 428—336 **15 Claims**

1. A ribbon for non-impact thermal transfer printing having a thermal transfer layer and an electrically resistive substrate layer wherein the improvement comprises said resistive layer comprising polyurethane having predominately only urethane functional groups and an electrically significant amount of conductive carbon black.

4,320,171

MAGNETIC RECORDING MEDIA CONTAINING ELASTOMERIC POLYURETHANE BINDERS IN THE MAGNETIC COATING

Herbert Motz, Beindersheim; August Lehner, Roedersheim-Gronau; Heinrich Hartmann, Limburgerhof; Rudolf Bachmann, Frankenthal; Hans-Joerg Hartmann, Feinsheim; Harald Frischmann, Willstaett; Roland Falk, Achern; Joachim Hack, Ludwigshafen; Milan Velic, Ludwigshafen, and Helmut Kopke, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 961,704, Nov. 17, 1978, abandoned. This application May 19, 1980, Ser. No. 150,749

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1977, 2753694

Int. Cl.³ B32B *27/40, 5/16*

U.S. Cl. 428—423.1 **5 Claims**

1. A magnetic recording medium comprising a non-magnetic base and, applied thereto, a firmly adhering magnetic coating consisting essentially of a dispersion of a magnetic pigment in a binder which contains at least 50 percent by weight of a thermoplastic polyurethane which is soluble in tetrahydrofuran, is free from isocyanate groups and has been made by reaction of (A) 1 mole of a hydroxy-containing polyester having a molecular weight of from 700 to 2,500, wherein said hydroxyl-containing polyester is formed by esterification of aliphatic dicarboxylic acids of 4 to 12 carbon atoms, carboxylic acid esters of 1 to 4 carbon atoms in the alcohol radical, carboxylic acid anhydrides or carboxylic acid chlorides with aliphatic glycols of 2 to 12 carbon atoms which may contain ether groups, in the presence as a chain extender of (B) from 0.3 to 3 moles of a linear aliphatic diol containing from 2 to 10 carbon atoms and (C) from 0.05 to 0.4 moles of a triol containing from 3 to 10 carbon atoms and (D) from 1.35 to 4.7 moles of an aromatic diisocyanate containing from 6 to 30 carbon atoms, the amount of isocyanate groups present in the reaction being approximately equivalent to the amount of hydroxy groups in the components A to C.

4,320,172

ORGANOPOLYSILOXANE RESIN COMPOSITIONS FOR RELEASE PAPERS

Minoru Takamizawa; Toshio Shinohara, both of Annaka; Yasushi Yamamoto, Takasaki; Tasuku Tanino; Kiyoyuki Takano, both of Tokushima, and Fumiaki Mori, Annan, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1980, Ser. No. 165,148

Claims priority, application Japan, Jul. 9, 1979, 54-86646; Jul. 13, 1979, 54-89148

Int. Cl.³ C08L *31/02, 67/06, 83/10*

U.S. Cl. 428—447 **5 Claims**

1. A resin composition which comprises

(a) 100 parts by weight of a base resin selected from the group consisting of alkyd resins and acrylic resins modified with an organopolysiloxane, of which from 15 to 50% by moles of the organic groups directly bonded to the silicon atoms in a molecule are phenyl groups, having at least one hydroxy-substituted organic group directly bonded to the silicon atom in a molecule as represented by the general formula

$$HO—R^1\text{-}(\text{-}S\text{-})_a\text{-}R^2—,$$

in which R^1 and R^2 are each independently a divalent hydrocarbon group and a is zero or 1,

(b) from 15 to 150 parts by weight of an alkanol-modified amino resin, and

(c) from 1 to 20 parts by weight of an acidic catalyst.

4,320,173

RUBBER COMPOSITIONS CONTAINING N-(CARBOXYALKYL)MALEAMIC ACID

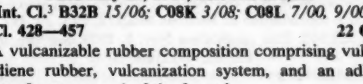
Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed May 19, 1980, Ser. No. 151,237

Int. Cl.³ B32B *15/06;* **C08K** *3/08;* **C08L** *7/00, 9/00*

U.S. Cl. 428—457 **22 Claims**

1. A vulcanizable rubber composition comprising vulcanizable diene rubber, vulcanization system, and an adhesive amount of a compound of the formula



(a)

in which n is one or two, and R is a straight or branched divalent or trivalent saturated aliphatic radical of 1–6 carbon atoms.

4,320,174
TRANSPARENT AND TRANSLUCENT VINYL POLYMERIC COMPOSITE

Elvira B. Rabinovitch, South Euclid, and James W. Summers, Bay Village, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 15, 1980, Ser. No. 187,379
Int. Cl.³ B32B *27/08*; B44D *1/44*
U.S. Cl. 428—518 14 Claims

1. A transparent or translucent polymeric composite material adapted for use outdoors comprising, a substrate containing a vinyl polymeric material selected from the group consisting of homopolymers of vinyl halides and vinylidene halides, copolymers of vinyl halides and vinylidene halides with each other and each with one or more polymerizable olefinic monomers having at least one terminal $CH_2{=}C<$ grouping, and chlorinated vinyl chloride homopolymers and copolymers, and mixtures of any of said homopolymers and copolymers, said substrate having integrally attached thereto a capstock containing a vinyl homopolymer or copolymer, from about 10 parts to less than about 35 parts by weight of a plasticizer, based on the weight of 100 parts of said homopolymer of copolymer, and from about 1 part to about 15 parts by weight of a clear U.V. light absorber, based on the weight of 100 parts of said homopolymer or copolymer, said U.V. light absorber being selected from the group consisting of substituted alkyl acrylates and alkoxy benzophenones.

4,320,175
LAMINATED FILM

Nobuyuki Hisazumi; Shinichiro Funabashi, and Katsuhiko Sugeno, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1980, Ser. No. 142,264
Claims priority, application Japan, Apr. 26, 1979, 54/51939
Int. Cl.³ B32B *27/08*
U.S. Cl. 428—518 7 Claims

1. A laminate film comprising at least two layers,

one layer being a gas-barriering layer composed of 100 parts by weight of a copolymer of vinylidene chloride of a reduced viscosity of 0.030 to 0.050 and 0.5 to 3 parts by weight of an epoxy-type stabilizer, and

another layer being a strengthening layer arranged to be adjacent to said gas-barriering layer and being composed of 100 parts by weight of a copolymer of vinylidene chloride of a reduced viscosity of 0.050 to 0.075, 0.5 to 3 parts by weight of an epoxy-type stabilizer and 4 to 20 parts by weight of an organic additive of a number average molecular weight of 800 to 10,000, said organic additive being selected from the group consisting of rosin esters, hydrogenated rosin esters, oligoesters, epoxy rosin oligomers, co-oligomers of styrene with butene, isobutene, butadiene or maleic acid, oligoamides, oligomers of butadiene, oligomers of butene and oligomers of ethylene.

4,320,176
SPLICE GUN SUPPLY STRIP

Irwin Zahn, New York, N.Y., assignor to General Staple Company, Inc., Woodside, N.Y.

Continuation of Ser. No. 939,478, Sep. 5, 1978, abandoned, which is a continuation of Ser. No. 842,572, Oct. 17, 1977, Pat. No. 4,129,941. This application Nov. 5, 1979, Ser. No. 90,903
Int. Cl.³ B21H *8/00*
U.S. Cl. 428—573 4 Claims

1. A supply band for use with an apparatus for forming a plurality of individual splices from said supply band, each of said splices having a predetermined length and a predetermined width less than said length, said supply band comprising a multiple turn coil of a continuous length of flat metal material having cooperating means for cooperating with feeding means of said apparatus to move said supply band into position in which said splices are formed from said supply band, said cooperating means including score lines formed in a first surface of said supply band and extending transversely across said supply band at preselected locations along said supply band, said score lines dividing each turn of said supply band into abutting sections arranged in end-to-end fashion, each of said sections having a length which corresponds to said length of said splices formed from said supply band, whereby each of said sections upon its separation from said supply band forms one of said splices.

4,320,177
ELECTRICALLY CONDUCTIVE PART WITH AN INSULATION MATERIAL WHICH WITHSTANDS HIGH TEMPERATURES AND A METHOD OF MANUFACTURING SUCH A PART

Alain Anton, Chaponnay, France, assignor to Societe Anonyme dite: Alsthom-Atlantique, Paris, France

Filed Nov. 20, 1979, Ser. No. 96,124
Claims priority, application France, Nov. 24, 1979, 78 33182
Int. Cl.³ C23C *5/00*
U.S. Cl. 428—675 3 Claims

1. In an electrically conductive article comprising a conductive core part and an insulation material surrounding said core part and being capable of withstanding high temperatures, the improvement wherein said conductive core part comprises a drawn down copper billet having a coating of a copper-aluminum alloy for protecting it against high temperature oxidation, and wherein said core part is manufactured by subjecting said copper billet coated with a copper-aluminum alloy to at least one hot drawing operation to reduce its diameter to a diameter between 13 and 8 mm, followed by a series of cold drawing operations with lubrication.

4,320,178
STRUCTURE OF THE INSULATOR—SEMICONDUCTOR TYPE

Daniel Chemla, 50 Ave. Jean Jaures, 92290 Chatenay Malabry; Louis Cot, Residence Les Pins No. 3 - Clapiers, 34170 Castelnau le Lez; Jean Jerphagnon, 38, rue de Kerrazion, 22560 Trebeurden, and Jean Durand, Mas Drevon H3, Rue J.R. de Comminges, 34100 Montpellier, all of France

Filed Apr. 2, 1980, Ser. No. 136,568
Claims priority, application France, Apr. 10, 1979, 79 09044
Int. Cl.³ H01L *21/18*
U.S. Cl. 428—698 6 Claims

1. A structure of the insulator-semiconductor type comprising a semiconducting crystalline substrate formed from a III-V compound of formula ($A^{III}B^{V}$) coated with an insulating layer, wherein the insulating layer is a sulphide in accordance with the formula ($A^{III}B^{V}$)S_4.

5. A process for the preparation of the structure according to claim 1, wherein a semiconducting crystalline substrate of formula $A^{III}B^{V}$ is prepared, this substrate is placed in a flask containing sulphur or hydrogen sulphide, the flask is placed in an oven, the flask is heated to a temperature of approximately 400° C., this temperature is maintained for the time necessary for obtaining a desired sulphide thickness, the temperature is returned to ambient temperature and the substrate is removed from the flask.

4,320,179
TRANSFERENCE AND PURIFICATION OF HALOGEN AND HYDROHALIC ACID IN AN ELECTROCHEMICAL SYSTEM

Thomas G. Hart, Royal Oak, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Apr. 3, 1978, Ser. No. 892,692
Int. Cl.³ H01M *8/06*
U.S. Cl. 429—15 16 Claims

1. A method of transferring or purifying at least one of halogen and hydrohalic acid which comprises providing a transfer cell comprising a housing having a permselective membrane dividing said casing into a first and second compart-

ment, a low halogen oxidation overvoltage electrode in said first compartment and a low halogen reduction overvoltage electrode in said second compartment; circulating a halide containing electrolyte through said first compartment; circulating a halide containing electrolyte containing halogen through said second compartment; and establishing a potential difference between said oxidation and reduction electrodes, wherein said halides and halogen are the same element, and there is no net consumption of halogen.

4,320,180

FUEL CELL

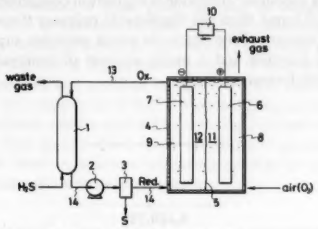
Ken Nozaki, Tokyo, Japan, assignor to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Oct. 14, 1980, Ser. No. 196,188

Claims priority, application Japan, Oct. 19, 1979, 54-134210

Int. Cl.³ H01M *8/18*

U.S. Cl. 429—20 **6 Claims**



1. A fuel cell, comprising an electrolytic cell, a diaphragm separating the interior of the electrolytic cell into a positive electrode chamber and a negative electrode chamber, a negative electrode disposed within said negative electrode chamber, a redox solution filling said negative electrode chamber, the redox solution producing elementary sulfide by reacting with hydrogen sulfide and being regenerated by oxidation on the negative electrode, means for withdrawing from the negative electrode chamber the redox solution in an oxidized state, means for bringing the oxidized redox solution into contact with hydrogen sulfide so as to reduce the redox solution and, at the same time, produce the elementary sulfur in the solution, means for removing the formed elementary sulfur from the reduced redox solution, and means for recycling to the negative electrode chamber the reduced redox solution.

4,320,181

NON-GASSING STORAGE BATTERY

Andreas Häbich, and Josef Arnold, both of Gerlingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

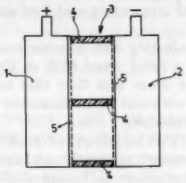
Filed Aug. 27, 1980, Ser. No. 181,687

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935363

Int. Cl.³ H01M *10/34*

U.S. Cl. 429—59 **15 Claims**

1. A non-gassing storage battery comprising alternating positive and negative electrodes separated from one another by separators and having a liquid acidic or alkaline electrolyte, the improvement comprising said separators being gas-permeable



and having at least the upper peripheral region consisting of a micro-porous gas-impermeable material.

4,320,182

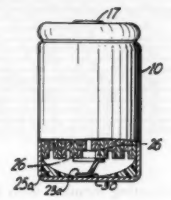
ELECTROCHEMICAL CELL HAVING CAST-IN-PLACE INSULATOR

Raymond K. Sugalski, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed Nov. 21, 1979, Ser. No. 96,461

Int. Cl.³ H01M *2/02*

U.S. Cl. 429—94 **3 Claims**



1. In an electrochemical cell having a conductive casing and an electrode plate assembly received therein, said plate assembly having exposable portions adjacent an interior conductive surface of the casing, the improvement comprising a hardened, initially flowable, insulating casting material self-adhered to said interior conductive surface and disposed intermediate said interior conductive surface and the exposable portions of said electrode plate assembly, said casting material being present in such amount as to prevent inadvertent electrical contact between portions of the plate assembly and the interior surface, and as to leave exposed an area of said interior conductive surface, and conductor means for electrically connecting another portion of said electrode assembly to said exposed surface area.

4,320,183

GRID FOR BATTERIES

Nawaz M. Qureshi, Morrisville, Pa., assignor to Exide Corporation, Philadelphia, Pa.

Filed Feb. 9, 1981, Ser. No. 232,576

Int. Cl.³ H01M *4/72*

U.S. Cl. 429—211 **7 Claims**

1. An integral, cast, high performance radial grid for supporting active mass in a lead-acid battery comprising an essentially flat rectangualr frame, one long side of said frame being the top member and the other long side being the bottom member, with a first and second side frame members connecting said top member and said bottom member, said top member having an essentially rectangular, current-collecting lug positioned thereon and extending upwardly therefrom, said lusg being positioned intermediate the center point of said top frame member and the corner of said frame where said first side

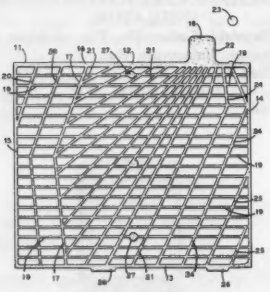
member and said top member meet said frame enclosing as wire grid members;

(a) a plurality of essentially horizontal wire members spaced about equally apart one from another and each extending between and connecting said first and second side frame members;

(b) a radii terminating wire member extending from said top member, at a point about 65% to about 85% across said top member from said first side member, toward and connecting with said bottom member and intersecting said horizontal members;

(c) at least one wire member positioned essentially parallel to said radii terminating member and extending from said top member intermediate said point of intersection of said top member with said radii terminating member and the corner of juncture of said top member and said second side;

(d) a plurality of diverging wire members extending obliquely downwardly from a plurality of points spaced along said top member between the intersection point of



said radii terminating member with said top member and the side of said lug adjacent said first side member, said diverging members intersecting at least one of said horizontal members and connecting said top member with one of said radii terminating member of said bottom member;

(e) at least one wire member intersecting said horizontal members, extending from said top member, from at least one point intermediate that side of said lug adjacent said first side member and said first side member, obliquely downwardly toward said first side member for a distance of about 20% of the height of said frame and then extending toward and connecting with said bottom member in a direction essentially parallel to the direction of the nearest of said diverging members; and

(f) at least one wire member intersecting some of said horizontal members and extending from said first side member at least one point intermediate said top member and said bottom member and connectng said first side member with said bottom member.

4,320,184

PRODUCTION OF A CELL ELECTRODE SYSTEM

Philip Bernstein, Glen Ridge, N.J., and James P. Coffey, Warwick, N.Y., assignors to MPD Technology Corporation, Wyckoff, N.J.

Filed Jan. 19, 1981, Ser. No. 226,502

Int. Cl.³ H01M *4/62*

U.S. Cl. 429—217 **22 Claims**

1. A method for producing a porous, conductive cell electrode system comprised of electrode active particles and a fibrillated polymeric material comprising subjecting a fibrillatable polymer, a particulate electrode active material and a major amount of removable, polymeric pore-former to conditions for fibrillating the polymer by a dry processing technique and for forming a precursor electrode composition comprising discrete polymeric fibers throughout an intimate mixture of electrode active particles, conductive carbon and a major amount of removable, polymeric pore-former.

4,320,185

PRODUCTION OF A CELL ELECTRODE SYSTEM

Philip Bernstein, Glen Ridge, N.J.; James P. Coffey, Warwick, N.Y.; Alan E. Varker, Warwick, N.Y.; John T. Arms, Monroe, N.Y., and William D. K. Clark, Warwick, N.Y., assignors to MPD Technology Corporation, Wyckoff, N.J.

Filed Jan. 19, 1981, Ser. No. 226,527

Int. Cl.³ H01M *4/62*

U.S. Cl. 429—217 **22 Claims**

1. A method for producing a porous, conductive electrode system comprised of electrode active material, and a porous, fiber-containing polymeric composition comprising subjecting a support-contributing polymer, a fibrillatable polymer, an electrode active material, and a major amount of a removable, polymeric pore-former to conditions for converting the fibrillatable polymer by a dry processing technique to fibers and for forming a precursor electrode composition comprising discrete fibers developed from the fibrillatable polymer throughout an intimate mixture of the electrode active particles, support-contributing polymer and a major amount of removable, polymeric pore-former.

4,320,186

ELECTROGRAPHIC METHOD FOR PREPARING ORIGINAL FOR PROJECTION AND TRANSFER FILM FOR USE IN METHOD

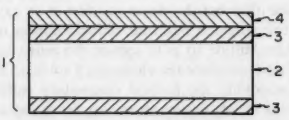
Mamoru Kato, Hirakata; Shoji Matsumoto, Neyagawa, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Apr. 11, 1980, Ser. No. 139,480

Claims priority, application Japan, Apr. 13, 1979, 54/44263

Int. Cl.³ G03G *13/16, 13/20*

U.S. Cl. 430—98 **9 Claims**



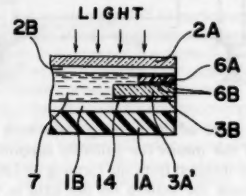
1. A method for preparing an original for projection, which comprises electrostatically transferring an image of a one-component type magnetic developer which has been formed on a photosensitive plate for electrostatic photography onto a toner receiving layer of a transparent transfer film, said transparent film comprising a transparent, heat-resistant plastic film substrate, said toner receiving layer, and an undercoating layer interposed between said substrate and said toner receiving layer, said toner receiving layer comprising a binder resin in an amount of at least 1.0 g/m^2 on a dry basis and having a surface resistance of 1.0×10^{10} to $1.0\times10^{13}\Omega$, said undercoating layer comprising an electrically conductive resin in an amount of at least 1.0 g/m^2 on a dry basis and having a surface resistance of 1.0×10^{6} to $9.0\times10^{9}\Omega$, and bringing the transferred developer image into contact with the surface of a roller under application of pressure, thereby fixing the transferred developer image on said toner receiving layer.

4,320,187

PHOTOGRAPHIC FILM UNIT FOR DIFFUSION TRANSFER WITH A TRANSLUCENT MASK SHEET

Katsuya Kozai, Minami-ashigara; Teruyoshi Makino, Isehara, and Hisashi Kikuchi, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 29, 1980, Ser. No. 191,781
Claims priority, application Japan, Sep. 27, 1979, 54/124934
Int. Cl.³ G03C *1/48, 5/54*
U.S. Cl. 430—207 2 Claims



1. A film unit for photography of the diffusive transfer process type, said unit comprising a laminate including a first photosensitive sheet, a mask sheet defining an image border definition with an aperture therein, a second sheet superposed on said first sheet in a face to face relationship with said first sheet and wherein a rupturable container is sandwiched between respective end portions of said first sheet and said second sheet in a manner such that a processing liquid contained in said container can be released in a spacing between said first sheet and said second sheet when subjected to pressure, and wherein at least an aperture bordering portion of said mask sheet is made of a translucent material.

4,320,188

PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING ELASTOMERS AND PHOTO-CURABLE ELEMENTS MADE THEREFROM

Gerhard Heinz, Weisenheim; Peter Richter, Frankenthal, and Mong-Jon Jun, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 17, 1980, Ser. No. 197,790
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1979, 2942183
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—281 10 Claims

1. A photopolymerizable composition which contains
(a) not less than 40% by weight of at least one elastomeric block copolymer which is soluble in developer solutions and has the structure A-B-C, where A, B and C are different polymer blocks linked chemically to one another, in which (a1) the polymer block A, accounting for from 5 to 25% by weight of the block copolymer, is prepared by polymerizing at least one styrene monomer of the formula CH_2=CRR' where R is hydrogen or methyl and R' is phenyl or C_1–C_4-alkyl-substituted phenyl, and has a second order transition point above +25° C.,
(a2) the polymer block B which accounts for from 15 to 90% by weight of the block copolymer is prepared by polymerizing at least one aliphatic diene hydrocarbon of 4 or 5 carbon atoms and has a second order transition point below −20° C., and
(a3) the polymer block C which accounts for from 5 to 60% by weight of the block copolymer is prepared by homopolymerization or copolymerization of aliphatic diene hydrocarbons of 4 or 5 carbon atoms or by random copolymerization of at least one aliphatic diene hydrocarbon of 4 or 5 carbon atoms with at least one styrene monomer of the formula CH_2=CRR', where R is hydrogen or methyl and R' is phenyl or C_1–C_4-alkyl-substituted phenyl, and has a second order transition point of from −20° C. to +15° C.
(b) not less than 1% by weight of at least one photopolymerizable olefinically unsaturated monomer compatible with the block copolymer (a) and
(c) from 0.1 to 10% by weight of at least one photopolymerization initiator.

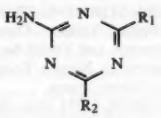
4,320,189

PHOTOPOLYMERIZABLE COMPOSITION CONTAINING S-TRIAZINE COMPOUND

Tadashi Taguchi, Kawasaki; Toshihide Takemoto, Yokohama; Noboru Fujikawa, Tokyo, and Mitsuo Kohno, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1980, Ser. No. 191,965
Claims priority, application Japan, Oct. 3, 1979, 54-127584
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—288 8 Claims

1. A photopolymerizable composition which comprises:
(a) at least one non-gaseous ethylenically unsaturated compound having at least two terminal ethylenic groups and capable of forming a high polymer with the aid of a photopolymerization initiator activated by actinic radiation,
(b) at least one thermoplastic organic polymer binder,
(c) at least one photopolymerization initiator activatable by actinic radiation, and
(d) at least one s-triazine compound represented by the formula:



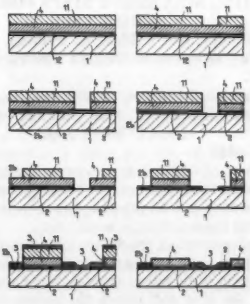
wherein R_1 and R_2 each independently stands for a hydrogen atom, an amino group, an aryl group, a straight chain or branched (C_1–C_4)alkyl group, a straight chain or branched (C_1–C_4)alkylamino group, or a halogen atom.

4,320,190

METHOD OF MANUFACTURING THE SUBSTRATE OF AN ELECTROCHROMIC DISPLAY CELL

Yves Ruedin, Saint-Blaise, Switzerland, assignor to Ebauches S.A., Neuchâtel, Switzerland

Filed Dec. 4, 1980, Ser. No. 212,905
Claims priority, application Switzerland, Dec. 18, 1979, 11208/79
Int. Cl.³ G03C *5/00*; B44C *1/22*
U.S. Cl. 430—296 17 Claims



1. Method of manufacturing the substrate of an electrochro-

mic display cell comprising the steps of providing a transparent and insulating plate; depositing successively, on the whole surface of the said plate, a layer of a transparent conductive material, a layer of an electrochromic material and a layer of a material which is positively sensitive to a radiation; exposing selectively to the said radiation a portion of the said sensitive layer; selectively eliminating the said exposed portion; etching successively the said electrochromic layer and the said conductive layer at the places exposed by said selective elimination so as to form, with the rest of the said conductive layer, a network of transparent conductive elements constituted by control electrodes situated at the places of the patterns to be displayed, terminal connection contacts of the cell and tracks connecting the said electrodes to the said contacts; exposing the remainder of the said sensitive layer, except at places corresponding to the said patterns to be displayed, and selectively eliminating the exposed portions of the said remainder of the sensitive layer; etching selectively the remainder of the electrochromic layer at the places exposed by this latter selective elimination; depositing a layer of a transparent dielectric material on the whole surface of the said substrate, except in the regions of the said contacts; and eliminating successively the remainder of the said sensitive layer with simultaneous elimination of the dielectric material carried thereby, the substrate being thus covered by a layer comprising zones of dielectric material and zones of electrochromic material, without any free space between these zones.

8. Method according to claim 1, wherein said sensitive material is a positively electronsensitive material.

4,320,191
PATTERN-FORMING PROCESS

Akira Yoshikawa, Higashi Yamato; Osamu Ochi, Kodaira; Tomoko Hisaki, Hamura, and Yoshihiko Mizushima, Fuchu, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

PCT No. PCT/JP79/00280, § 371 Date Jul. 7, 1980, § 102(e) Date Jul. 7, 1980, PCT Pub. No. WO80/01020, PCT Pub. Date May 15, 1980

PCT Filed Nov. 1, 1979, Ser. No. 201,663

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—296 **2 Claims**

1. A pattern-forming process, comprising the steps of exposing a radiation sensitive chalcogenide layer consisting of an amorphous chalcogenide layer and a thin silver layer successively superimposed on a substrate to a light or an accelerated corpuscular beam according to a given pattern to form silver-doped regions in the amorphous chalcogenide layer at exposed areas, and then etching out the amorphous chalcogenide layer not doped with silver in an etching stage with gas plasma to leave only silver-doped amorphous chalcogenide layer on the substrate according to the given pattern.

4,320,192
ADJUSTING SUCCESSIVE STEPS FOR MAKING CARRIER TAPE

Michael T. Gursky, and William W. Pcihoda, both of Lehigh County, Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Division of Ser. No. 8,621, Feb. 1, 1979, Pat. No. 4,227,983. This application Apr. 17, 1980, Ser. No. 141,434

Int. Cl.³ H05K *3/00*

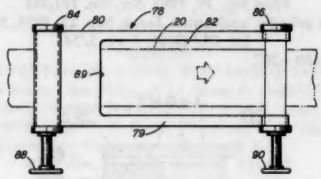
U.S. Cl. 430—323 **10 Claims**

1. A method of forming a pattern in a strip of metal foil having no substantial resistance to bending, comprising:

driving the strip in a lengthwise direction in a substantially horizontal plane common to the strip;

guiding and supporting the driven strip through a succession of chambers, each having stationary inlet and outlet means for the strip with means therebetween for guidably supporting the strip and means therealong for forming the pattern, said chambers providing a succession of substantially simultaneously operating forming steps to form the pattern in the strip, each step requiring a separate exposure time interval suitable for such forming step; and

shielding the strip with means disposed parallel to the horizontal plane of the strip within the confines of a chamber



at one or more of the forming steps such that, along a portion of the means for guidably supporting the strip, said strip is shielded from the forming and along a portion of said means the pattern on the strip is exposed for a respective time interval suitable for the said forming step.

4,320,193
PHOTOGRAPHIC EMULSIONS HAVING SPECIAL CHROMATIC EFFECTS

Jean J. Robillard, Pelham, Mass., assignor to Bristol-Myers Company, New York, N.Y.

Filed May 21, 1980, Ser. No. 151,806

Int. Cl.³ G03C *1/76*

U.S. Cl. 430—503 **6 Claims**

1. A color photographic element having special chromatic effects comprising a support, a red-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer, and a blue-sensitive silver halide emulsion layer, the emulsion layers being arranged one behind the other, two of the emulsion layers being provided in each layer with a color coupler which forms a dye non-complementary in color to that for which that emulsion layer is sensitized, the remaining emulsion layer containing no coupler.

4,320,194
PROCESS FOR THE PRODUCTION OF CARRIER PARTICLES FROM YEAST CELLS AND FOR PRODUCING DIAGNOSTIC AGENTS THEREFROM AND TEST KITS CONTAINING SUCH AGENTS

Frederick G. Bull, West Wellow, England, assignor to Gist-Brocades N.V., Delft, Netherlands

Filed Jul. 28, 1980, Ser. No. 172,992

Claims priority, application United Kingdom, Jul. 30, 1979, 26508/79

Int. Cl.³ G01N *33/54*

U.S. Cl. 435—7 **18 Claims**

1. Process for the production of carrier particles from yeast cells which comprises cross-linking the proteins in the cell cytoplasm by reaction with a cross-linking agent and stabilizing the carbohydrate components of the yeast cell wall by reaction with an epihalohydrin or other low molecular weight epoxide.

4,320,195

STEROID PRODUCTION

Frank Hill, Mettmann-Obschwarzbach; Wolfgang Preuss, Monheim; Joachim Schindler, Hilden; Rolf Schmid, Dusseldorf, and Alfred Struve, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 12, 1979, Ser. No. 29,415

Claims priority, application Austria, Apr. 17, 1978, 2662/78

Int. Cl.[3] C12P *33/16;* C12N *15/00, 1/20;* C12R *1/15*

U.S. Cl. 435—55 17 Claims

1. A process for producing a 17-C-steriod-alpha-propionic acid selected from the group consisting of 3-oxo-pregna-4-ene-20-carboxylic acid, 3-oxo-pregna-1,4-diene-20-carboxylic acid, and mixtures thereof by microbial side chain degradation on 17-C side chain steroid substrates comprising,

(a) cultivating a defect block mutant microorganism capable of selectively degrading side chains at the C-17 position of a steroid without substantially degrading the steroid rings and not degrading an α-propionic acid residue at said C-17 position in an aqueous culture medium under aerobic conditions in the presence of a steroid substrate until there is an accumulation of said steroid acid, and

(b) isolating said steroid acid.

16. A biologically pure culture of a microorganism having the identifying characteristics of strain CBS 437.77 (ATCC 31385) and the capacity to produce in isolatable amounts a steroid selected from the group consisting of 3-oxo-pregna-4-ene-20-carboxylic acid, 3-oxo-pregna-1,4-diene-20-carboxylic acid and mixtures thereof.

4,320,196

SEMI-SYNTHESIS OF HUMAN INSULIN

Kazuyuki Morihara; Tatsushi Oka, both of Osaka, and Hiroshige Tsuzuki, Hirakata, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Apr. 9, 1980, Ser. No. 138,514

Claims priority, application Japan, Apr. 13, 1979, 54-45710

Int. Cl.[3] C12P *21/06*

U.S. Cl. 435—70 14 Claims

1. A process for preparing a B30-threonine-insulin which comprises reacting a des-B30-insulin with a threonine derivative of the formula

$$Thr(R^1)(R^2)$$

wherein Thr is an L-threonine residue, R^1 is hydrogen or a hydroxy-protecting group and R^2 is a carboxyl-protecting group, in a molar ratio of the threonine derivative to the des-B30-insulin of 5:1 to 1000:1, and in the presence of an enzyme specifically acting on the basic-amino-acid carbonyl in peptide bondings selected from the group consisting of trypsin, a trypsin-like enzyme produced by *Streptomyces fradiae* ATCC 3535 and a trypsin-like enzyme produced by *Streptomyces erythreus,* and subjecting the resultant product to one or more reactions to remove all of the protecting groups.

4,320,197

SEMI-SYNTHESIS OF HUMAN INSULIN

Kazuyuki Morihara; Tatsushi Oka, both of Osaka; Masami Soejima, Tsuchiura, and Takeharu Masaki, Ibaraki, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Apr. 9, 1980, Ser. No. 138,513

Claims priority, application Japan, Apr. 13, 1979, 54-45711

Int. Cl.[3] C12P *21/06*

U.S. Cl. 435—70 12 Claims

1. A process for preparing a B30-threonine-insulin which comprises reacting a des-B30-insulin with a threonine derivative of the formula

$$Thr(R^1)(R^2)$$

wherein Thr is an L-threonine residue, R^1 is hydrogen or a hydroxy-protecting group and R^2 is a carboxyl-protecting group, in a molar ratio of the threonine derivative to the des-B30-insulin of 5:1 to 1000:1, and in the presence of an enzyme specifically acting on the lysine carbonyl in peptide bondings and produced by *Achromobacter lyticus* M 497-1, and subjecting the resultant product to one or more reactions to remove all of the protecting groups.

4,320,198

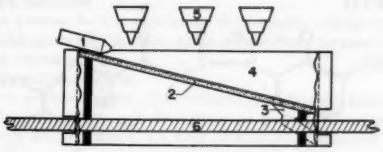
FIBER PRODUCTION FROM CONTINUOUS CULTIVATION OF MICRO-ORGANISMS

Roy L. Mynatt, 1929 Plymouth Rd., #1014, Ann Arbor, Mich. 48105

Continuation-in-part of Ser. No. 64,387, Aug. 8, 1979, abandoned. This application Oct. 15, 1979, Ser. No. 84,786

Int. Cl.[3] C12P *19/04*

U.S. Cl. 435—101 13 Claims



1. A process for the production of cellulose fibers suitable for the manufacture of paper comprising the steps of:

innoculating a pitted plate with a micro-organism adapted to produce abundant cellulosic fibers,

supplying a nutrient substrate to the micro-organism sufficient to promote abundant growth of the cellulosic fibers,

periodically harvesting the cellulosic fibers produced by the micro-organisms by passing a blade over the plate to shear off the fibers from the micro-organisms, and,

treating the fibers to remove any undesirable non-cellulosic materials as required.

6. Apparatus for the cultivation of micro-organisms that produce cellulosic fiber growth suitable for the manufacture of paper comprising,

a pitted plate to support the micro-organism growth,

means for flowing a nutrient substrate over the surface of the plate,

means for harvesting the fiber growth extending from the pitted plate, the harvesting means comprising a blade adapted to be periodically passed over the surface of the plate to shear off and collect the fiber growth, and,

means for conveying the harvested fibers from the harvesting means.

4,320,199

FERMENTATION PROCESS FOR PRODUCING NOCARDICINS A AND B

Koji Tomita, Kawasaki; Hiroshi Tsukiura, Mitaka, and Hiroshi Kawaguchi, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Nov. 3, 1980, Ser. No. 203,778

Int. Cl.[3] C12P *17/10;* C12N *1/20*

U.S. Cl. 435—121 5 Claims

1. A process for the preparation of a mixture of nocardicins A and B which comprises cultivating a strain of *Microtetraspora caesia* sp. nov. having the identifying characteristics of ATCC Nos. 31724 or 31725 under submerged aerobic conditions in an aqueous medium containing assimilable sources of carbon and nitrogen at a temperature of from about 20° C. to about 50° C. until a substantial amount of the nocardicin mixture is produced and accumulated in the culture medium.

4,320,200
ANTIBIOTIC

Eiji Higashide, Takarazuka; Mitsuko Asai, Takatsuki, and Seiichi Tanida, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

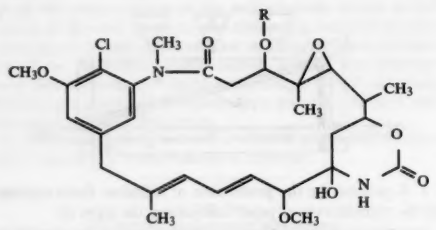
Division of Ser. No. 972,492, Dec. 22, 1978, which is a division of Ser. No. 811,448, Jun. 29, 1977, Pat. No. 4,162,940. This application Mar. 19, 1980, Ser. No. 131,787

Claims priority, application Japan, Mar. 31, 1977, 52-37166; Apr. 1, 1977, 52-37886

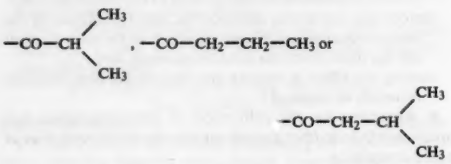
Int. Cl.³ C12N *1/20*

U.S. Cl. 435—253 1 Claim

1. A substantially pure culture of the microorganism belonging to the genus Nocardia having the identifying characteristics of ATCC 31281, said culture being capable of producing in a culture medium containing assimilable carbon and digestible nitrogen sources, a recoverable amount of an antibiotic of the formula



wherein R represents



4,320,201
METHOD FOR MAKING COLLAGEN SPONGE FOR MEDICAL AND COSMETIC USES

Alexander Berg, Hirschberg, and Zdenek Eckmayer, Weinheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,485

Int. Cl.³ C14C *1/00*

U.S. Cl. 435—265 10 Claims

1. A process for producing collagen sponge which is insoluble but highly swellable in water, the sponge having a velour-like surface and being particularly suited for medical and cosmetic applications, comprising dehairing animal hides, enzymatically degrading the hides to form a collagen-containing mass, digesting the mass in acid or alkali to reduce the amido nitrogen content thereof to below about 0.25 mol %, swelling the mass in acid, comminuting part of the swollen mass to a fiber length of about 1 cm and a part to a fiber length of about 1 mm, forming a paste in water of about 0.5 to 3 weight % of a mixture which on a dry basis comprises about 20 to 60 weight % of the 1 cm fibers and about 80 to 40 weight % of the short fibers, adjusting the pH to about 2 to 3.5, cross-linking the paste in the presence of a cross-linking agent at a temperature below about 0° C. to form a swollen sponge of high purity, and removing water from the swollen sponge.

4,320,202
INORGANIC ELASTIC FOAMED PRODUCTS AND METHOD OF THE PREPARATION THEREOF

Kyukichi Yamamoto, Kamakura; Masaji Kurosawa, Matsudo, and Taro Matsui, Nara, all of Japan, assignors to Nichias Corporation, Tokyo, Japan

Filed Mar. 5, 1980, Ser. No. 127,312

Claims priority, application Japan, Mar. 9, 1979, 54-26704

Int. Cl.³ C04B *21/00*

U.S. Cl. 501—80 2 Claims

1. An inorganic elastic foamed product prepared by drying of an aqueous fiber-dispersed slurry retaining bubbles and consisting essentially of inorganic fibers, from 20–50% by weight synthetic fluormica of the non-restrictive swelling type and from 1.2–16% by weight surface active agents, in which the inorganic fibers are entangled with each other and have films of the fluormica formed therebetween, said films having bubbles retained therein.

4,320,203
CERAMIC ALLOY

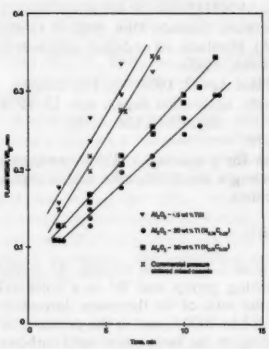
Gunnar Brandt, Solna; Carl P. Björkman, Stockholm, and Carl S. G. Ekemar, Saltsjö-Boo, all of Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Aug. 27, 1980, Ser. No. 181,866

Claims priority, application Sweden, Sep. 3, 1979, 7907304

Int. Cl.³ C04B *35/56, 35/58*

U.S. Cl. 501—87 19 Claims



1. Ceramic alloy composition consisting essentially of from about 40 to about 95 w/o of aluminum oxide, and from about 5 to about 60 w/o of nitrides and/or carbonitrides of one or more metals of the group IV B, V B and VI B of the periodic system and from 0 to about 2 w/o of one or more sintering promoting oxides, the total composition of said nitrides and/or carbonitrides being given by the expression

$$(M_aM'_bM''_c)\,(C_xN_yO_z)_v$$

where

M=Ti, Zr, Hf

M′=V, Nb, Ta

M″=Cr, Mo, W

and

$a+b+c=1$, $b+c \leqq 0.20$; $0.85 \leqq v \leqq 1.05$, $x+y+z=1$, $x \leqq 0.5$, $z \leqq 0.15$,

the composition being further characterized in that from 2 to 95 v/o of the aluminum oxide matrix has a nitrogen-stabilized cubic structure, the balance of the aluminum oxide comprising the stable hexagonal (corundum) structure.

4,320,204

SINTERED HIGH DENSITY BORON CARBIDE

Gerald Q. Weaver, Princeton, Mass., assignor to Norton Company, Worcester, Mass.

Filed Feb. 25, 1981, Ser. No. 237,831
Int. Cl.³ C04B 35/56
U.S. Cl. 501—91 3 Claims

1. A sintered high density wear resistant refractory composition consisting of from 60 to 98% by weight of boron carbide, 2 to 40% by weight of silicon carbide, and 0 to 10% by weight of aluminum, said refractory composition having a density of at least 85% of theoretical density.

4,320,205

PROCESS FOR PRODUCING FLUORINATED POLYMER HAVING ION-EXCHANGE GROUPS

Tatsuro Asawa; Haruhisa Miyake, both of Yokohama, and Masami Yamashita, Yokosuka, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Sep. 2, 1980, Ser. No. 183,165
Claims priority, application Japan, Sep. 25, 1979, 54-122100
Int. Cl.³ C08F 2/06
U.S. Cl. 521—38 12 Claims

1. In a process for producing a fluorinated copolymer having ion-exchange groups by copolymerizing a fluorinated ethylenically unsaturated monomer and a monomer having a carboxylic acid functional group or a group convertible to a carboxylic acid group in an aqueous medium in the presence of a polymerization initiator source, the improvement comprising: conducting the copolymerization reaction in the presence of a molecular weight regulator selected from the group consisting of aliphatic alkanes, alicyclic alkanes, a C_1–C_8 alcohol, an alkylene oxide, an aldehyde, a ketone, a cyclic ether and a lactone.

4,320,206

EMULSION REGENERANT FOR ION EXCHANGE RESINS

John C. Konen, Walnut Creek, Calif., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 14, 1980, Ser. No. 196,520
Int. Cl.³ B01J 49/00
U.S. Cl. 521—26 10 Claims

1. A process for regenerating at least partially exhausted ion exchange materials containing both anion and cation types of ion exchange functional groups, the process comprising the consecutive steps of

(a) treating the materials with a first regenerant to regenerate one of the types of ion exchange functional groups to the desired ionic form,

(b) separating the first regenerant from the materials,

(c) treating the materials with a second regenerant comprising an ion exchange resin emulsion in an ionic form suitable for regenerating the other type of ion exchange functional groups, to regenerate the other type of ion exchange functional groups to the desired ionic form, and

(d) separating the second regenerant from the materials.

4,320,207

POLYESTER FILM CONTAINING FINE POWDER OF CROSSLINKED POLYMER

Masamichi Watanabe, and Seiji Sakamoto, both of Yokohama, Japan, assignors to Diafoil Company Limited, Tokyo, Japan

Filed Apr. 28, 1980, Ser. No. 144,047
Claims priority, application Japan, Jan. 25, 1979, 54-7615; May 19, 1979, 54-61654; May 19, 1979, 54-61655
Int. Cl.³ C08L 67/02
U.S. Cl. 521—54 2 Claims

1. A polyester film containing from 0.001% to 4% by weight fine particles of a crosslinked polymer having an average diameter of 0.1 to 5μ, said fine particles containing numerous pores and being derived by pulverization from a crosslinked polymer having a specific area of at least 1 m^2/g and a pore volume of at least 0.1 ml/g, and having a functional group capable of reacting with the polyester to form a covalent bond or from a crosslinked polymer having no functional group capable of reacting with the polyester and obtained by using at least one member of the class consisting of styrene and an alkyl-substituted styrene as a monovinyl component.

4,320,208

PROCESS FOR THE PRODUCTION OF POLYURETHANE PLASTICS IN WHICH POLYISOCYANATES ARE REACTED WITH REACTIVE ORGANIC FILLERS COMPRISING BIOMASSES

Artur Reischl, and Kuno Wagner, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 5, 1980, Ser. No. 146,861
Claims priority, application Fed. Rep. of Germany, May 21, 1979, 2920527
Int. Cl.³ C08G 18/14, 18/08
U.S. Cl. 521—102 14 Claims

1. A process for the production of optionally cellular polyurethane plastics by the isocyanate polyaddition process comprising reacting:

(A) a polyisocyanate;

(B) a reactive organic filler comprising a biomass based on microorganisms and derivatives or decomposition products thereof which has been irreversibly denatured and deodorized by reaction with isocyanates and/or by reaction with carbonyl compounds and compounds capable of aminoplast and/or phenoplast formation; optionally

(C) a low molecular weight and/or relatively high molecular weight compound containing isocyanate-reactive hydrogen atoms; and optionally

(D) blowing agents, catalysts and additives.

4,320,209

AMIDE NUCLEATING AGENTS FOR BUTENE-1 POLYMER COMPOSITIONS

Ananda M. Chatterjee, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 8, 1980, Ser. No. 214,148
Int. Cl.³ C08L 23/20
U.S. Cl. 525—6 18 Claims

1. A method for promoting crystallization from the melt of an isotactic butene-1 homopolymer or isotactic butene-1-ethylene copolymer having no more than about 15 mole percent of ethylene, which comprises adding to a composition comprising the homopolymer or copolymer about 0.02 to 5.0% by weight of a nucleating agent selected from the group consisting of 1-naphthalene acetamide; N-stearoyl-p-aminophenol; mercapto-N-2-naphthylacetamide; malonamide; nicotinamide; isonicotinamide; benzamide; salicylamide; and anthranilamide.

4,320,210

ETHYLENE POLYMER FIBRILS

Jin K. Kim; Clarence R. Murphy, both of Houston, Tex., and Edward W. Smith, Gibsonia, Pa., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 12, 1980, Ser. No. 215,905
Int. Cl.³ C08L 23/26, 29/04, 23/06
U.S. Cl. 525—57 3 Claims

1. Ethylene polymer fibrils which can be converted to a water-laid hand sheet having the following minimum factored values:

Mullen Burst: 30 psi
Elmendorf Tear Strength: 300 grams/sheet
Tensile Strength: 15 lbs/inch
Elongation at Break: 40%

said fibrils being characterized in having;

(a) a melt temperature of at least about 137° C.,

(b) a molecular weight of at least 250,000,

(c) at least about 1.2 weight % of polyvinyl alcohol sorbed thereon,

(d) a zero-span breaking length of at least about 25,000;

said fibrils being further characterized in having been prepared:

(1) from an ethylene polymer having a density of at least about 0.93 grams/ml, a melt temperature of at least 140° C., and an apparent melt viscosity of at least about 1.3×10^6 poises at 300° C. at an apparent shear rate of 1 $second^{-1}$;

(2) by a process including the steps of;

(i) dissolving the ethylene polymer of (1) above in a solvent at an elevated temperature of at least about 125° C.,

(ii) subjecting the ethylene polymer solution of (i) above to intense shearing conditions,

(iii) immediately after or simultaneously with the imposition of said shearing conditions upon said ethylene polymer solution cooling said solution and/or adding thereto a miscible liquid which is a nonsolvent for said ethylene polymer so as to precipitate ethylene polymer fibrils therefrom,

(iv) recovering the ethylene polymer fibrils from step (iii).

(v) treating the recovered ethylene polymer fibrils with a liquid that is miscible with both water and the solvent employed in step (i) to remove substantially all of said solvent from the recovered fibrils, and

(vi) treating the ethylene polymer fibrils from step (v) with an aqueous solution of polyvinyl alcohol so as to sorb polyvinyl alcohol on said fibrils,

the temperature employed in step (2) (i), the time period in which the ethylene polymer solution is maintained at such temperature, and the intensity of the shear imposed on the ethylene polymer solution in step (2) (ii) being such that the molecular weight of the ethylene polymer in the recovered fibrils is less than 35% of the molecular weight of the ethylene polymer as set forth in step (i).

4,320,211

HOT MELT ADHESIVE COMPOSITIONS CONTAINING A TERPENE-URETHANE RESIN, ETHYLENE COPOLYMER AND ALKENYL SUCCINIC ANHYDRIDE

Vikramkumar Acharya, and Pallavoor R. Lakshmanan, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 174,296, Jul. 31, 1980, abandoned. This application Jan. 28, 1981, Ser. No. 229,351

Int. Cl.³ C08F *8/30;* **C08K** *5/01;* **C08L** *91/06*

U.S. Cl. 525—126 **9 Claims**

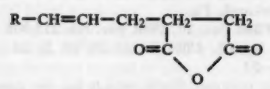
1. A hot melt adhesive composition consisting essentially of:

(a) 10–30 weight % of an alkenyl succinic anhydride,

(b) 20–60 weight % of an ethylene copolymer, and

(c) 10–40 weight % of a tackifying resin;

said alkenyl succinic anhydride having the structure:



where R is an alkyl group containing at least about 15 carbon atoms; said ethylene copolymer having polymerized therein at least 40 weight % polymerized ethylene and the balance one or more polymerized monomers from the group consisting of vinyl acetate, acrylic and methacrylic acid and alkyl esters of acrylic and methacrylic acid; and said tackifying resin being a terpene-urethane resin having a Ring and Ball softening point of about 80°–135° C.

4,320,212

TERNARY POLYCARBONATE COMPOSITIONS CONTAINING POLYACRYLATE AND THERMOPLASTIC POLYESTER

Ping Y. Liu, Naperville, Ill., assignor to General Electric Co., Mt. Vernon, Ind.

Filed Mar. 20, 1980, Ser. No. 132,330

Int. Cl.³ C03L *33/08, 69/00*

U.S. Cl. 525—148 **12 Claims**

1. A ternary polycarbonate composition comprising in admixture, a major amount of a high molecular weight aromatic polycarbonate, a minor amount of an acrylate copolymer which is a copolymer of a C_1–C_5 acrylate and a C_1–C_5 methacrylate, and a minor amount of a thermoplastic polyester.

4,320,213

HIGH-IMPACT POLYAMIDE MOLDING RESIN COMPOSITIONS

James C. Woodbrey, Chesterfield, Mo., and Marlowe V. Moncur, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 956,480, Oct. 30, 1978, abandoned. This application Oct. 24, 1979, Ser. No. 84,441

Int. Cl.³ C08L *77/00*

U.S. Cl. 525—179 **26 Claims**

1. A composition comprising the product of melt-blending:

(a) from about 50 percent to about 97 percent by weight of a polyamide resin;

(b) from about 3 percent to about 50 percent by weight of a hydroxyl-functional elastomer containing at least 5 mole equivalents of hydroxyl groups per 10^6 grams of elastomer; and

(c) from about 0.1 percent to about 10 percent by weight of a succinic-functional coupling agent, wherein the coupling agent provides effective coupling of the elastomer to the polyamide.

4,320,214

METHOD OF MAKING SILANE-MODIFIED ETHYLENE-TYPE RESIN

Hiroshi Harayama, Kusatsu; Ken Shinkai, Hirakata; Hiroshi Takahashi, Otsu, and Masahiro Mizusako, Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 14, 1978, Ser. No. 969,589

Claims priority, application Japan, Dec. 15, 1977, 52-151422

Int. Cl.³ C08F *255/00, 255/02*

U.S. Cl. 525—264 **4 Claims**

1. That method of making silane-modified ethylene-type resin with good moldability which method comprises melt-kneading a mixture consisting essentially of an alkoxy-silane compound having at least one unsaturated radical, 2.5 dimethyl 2.5 di (t-butyl-peroxy) hexane, and an ethylene-type resin selected from the group consisting of low density polyethylene, high density polyethylene, and copolymers having ethylene as a principal component, and including in said mixture an amount of zinc oxide no later than the time during which said mixture is in the molten state during said melt-kneading step.

4,320,215

POLYMERIZATION OF VINYL CHLORIDE WITH PHENOLIC COMPOUNDS

Kazuya Yonezawa, and Tadashi Osawa, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 841,297, Oct. 12, 1977, abandoned. This application Nov. 7, 1979, Ser. No. 91,969

Claims priority, application Japan, Oct. 12, 1976, 51-122696; Apr. 18, 1977, 52-44907; Aug. 26, 1977, 52-102852

Int. Cl.³ C08F *2/20, 2/24, 2/02*

U.S. Cl. 526—62 **10 Claims**

1. A method of polymerizing vinyl chloride or a mixture of

monomers comprising a major proportion of vinyl chloride with a minor proportion of other monomers copolymerizable therewith, in a polymerization vessel having accessories; wherein prior to polymerization, the surfaces of said polymerization vessel and accessories are coated with a compound consisting essentially of a condensation product of a phenolic compound having two or three OH groups, at least two of said OH groups located on adjacent carbon atoms of aromatic nucleus with an aromatic aldehyde; and wherein said phenolic compound is selected from the group consisting of pyrogallol, hydroxyhydroquinone, and mixtures thereof.

4,320,216
FLUOROELASTOMER GELLING AGENTS AND PRODUCTS MADE THEREFROM

David Apotheker, deceased, late of Wilmington, Del. (by Marie T. Barry, executor), assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 107,012, Dec. 26, 1979, abandoned, which is a division of Ser. No. 42,946, May 29, 1979, Pat. No. 4,211,868. This application May 29, 1980, Ser. No. 154,514

Int. Cl.³ C08F *214/18, 214/22, 214/26*

U.S. Cl. 526—248 **18 Claims**

1. Gelled fluoroelastomers selected from the group consisting of (A) copolymers with interpolymerized units consisting essentially of vinylidene fluoride units, fluorine containing olefin units other than vinylidene fluoride units, optionally, at least one of perfluoroalkyl perfluorvinyl ether units, bromotrifluoroethylene units, bromotetrafluorobutene units or perfluorodivinyl ether units and a gelling agent selected from the group consisting of 1,3,5-tris-(3,3-difluoro-2-propenyl)-s-triazine-2,4,6-(1H,3H,5H)-trione and 1,3-bis-3-(3,3-difluoro-2-propenyl)-5-methyl-s-triazine-2,4,6-(1H,3H,5H)-trione and (B) copolymers with interpolymerized units consisting essentially of tetrafluoroethylene, perfluoro(methyl vinyl ether), a monomer selected from the group consisting of:

(a) perfluoro(4-cyanobutyl vinyl ether),
(b) perfluoro(4-carbomethoxybutyl vinyl ether),
(c) perfluoro(2-phenoxypropyl vinyl ether),
(d) perfluoro(3-phenoxypropyl vinyl ether), and
(e) perfluoro(8-cyano-5-methyl-3,6-dioxa-1-octene) and a gelling agent selected from the group consisting of 1,3,5-tris-(3,3-difluoro-2-propenyl)-s-triazine-2,4,6-(1H,3H,5H)-trione and 1,3-bis-3-(3,3-difluoro-2-propenyl)-5-methyl-s-triazine-2,4,6-(1H,3H,5H)-trione, said gelling agent comprising 0.05–3.0 weight percent of said gelled fluoroelastomer.

4,320,217
POLYMERIZATION PRODUCTS OF POLYIMIDE DERIVATIVES HAVING ACETYLENIC TERMINAL AMIDE GROUPS

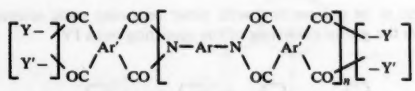
Gaetano F. D'Alelio, South Bend, Ind., and Phillip A. Waitkus, Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Filed Jan. 25, 1980, Ser. No. 115,486

Int. Cl.³ C08F *138/00*

U.S. Cl. 526—285 **21 Claims**

1. An addition polymerization product of the unsaturated amide of the formula:



wherein:

Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar′ radical except that in the case of the Ar′ being a naphthalene radical one or both pairs of the carbonyl groups may be attached to peri carbon atoms;

Ar is a divalent aromatic organic radical;

n is zero or an integer of at least one;

Y is —NRR′;

R is an organic moiety containing 1 to 18 carbon atoms;

R′ is an organic moiety containing 2 to 14 carbon atoms and having a terminal CH≡C— structure;

Y′ is —NRR, —OR, —OH or —X,

X is a halogen.

4,320,218
BINDER COMPOSITION

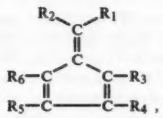
Bruce A. Gruber, Worthington; Heimo J. Langer, and William R. Dunnavant, both of Columbus, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 4, 1980, Ser. No. 174,970

Int. Cl.³ C08F *32/06*

U.S. Cl. 526—308 **17 Claims**

1. A composition capable of curing in the presence of oxygen containing a fulvene of the formula:



wherein each R_1 and R_2 individually is hydrogen or a hydrocarbon containing 1 to 10 carbon atoms, or a hydrocarbon containing one or more oxygen bridges in the chain; or a furyl group; or are interconnected to form a cyclic group, each R_3 and R_6 individually is hydrogen or methyl, each R_4 and R_5 is hydrogen or methyl or

provided that a maximum of only one such R_3, R_4, R_5 and R_6 is methyl, and provided that a maximum of any one such R_4 and R_5 is

or prepolymer thereof or mixtures thereof; and a catalyst consisting essentially of a catalytic amount of a metal salt catalyst wherein the metal constituent of said salt is capable of existing in at least two valence states, and wherein said salt is a salt of carboxylic acid.

4,320,219

POLYMERIZATION OR INORGANIC ELEMENT-CONTAINING MONOMERS USING PLASMA, AND THE FORMED PRODUCT

Yoshihito Osada, Mito, Japan; Alexis T. Bell, Oakland, and Mitchel M. Shen, Piedmont, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 44,048, May 31, 1979, Pat. No. 4,279,723, Continuation-in-part of Ser. No. 934,855, Aug. 18, 1978, Pat. No. 4,212,719, and a continuation-in-part of Ser. No. 882,124, Feb. 28, 1978, abandoned. This application Dec. 15, 1980, Ser. No. 216,949

Int. Cl.³ C01B *35/16;* C08F *2/52;* C08G *79/02*

U.S. Cl. 528—4 AD 7 Claims

1. A method for the polymerization of a carborane monomer comprising establishing and maintaining a contained zone of ionized gas plasma at an energy of less than 100 eV by applying an electric field said gas plasma being in contact with the surface of a non-vapor volume of said carborane monomer to cause it to polymerize.

4,320,220

CATHODICALLY DEPOSITABLE COATING COMPOSITIONS AND PROCESS FOR SAME

Georgios Pampouchidis, Graz, Austria, assignor to Vianova Kunstharz, A.G., Vienna, Austria

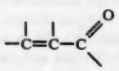
Filed Jul. 20, 1977, Ser. No. 816,937

Claims priority, application Austria, Jul. 19, 1976, 5283/76; Oct. 29, 1976, 8066/76; Oct. 29, 1976, 8067/76; Dec. 20, 1976, 9454/76

Int. Cl.³ C08G *18/71, 18/62, 18/76, 18/67*

U.S. Cl. 524—591 42 Claims

1. Process for producing self-crosslinking coating compositions for cathodically depositable electrodeposition paints including the steps of reacting (A) a resin carrying reactive amine groups and reactive hydroxyl or carboxyl groups, or mixtures thereof, with (B) a sufficient amount to render the coating composition water dilutable when reacted with an acid, of a reaction product carrying one free isocyanate group and which is obtained through reaction of aromatic or aliphatic or cycloaliphatic polyisocyanates or mixtures thereof and α,β-ethylenically unsaturated monomers carrying at least one isocyanate reactive hydrogen atom and the group



and reacting the reaction product of (A) and (B) with an acid until water soluble.

4,320,221

ADDITION POLYMERIZABLE ISOCYANATE-POLYOL ANAEROBIC ADHESIVES

Dwight K. Hoffman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 12, 1980, Ser. No. 215,996

Int. Cl.³ C08G *18/62*

U.S. Cl. 528—69 12 Claims

1. An adhesive comprising:

(a) the reaction product of:

(1) an addition polymerizable ethylenically unsaturated isocyanate and

(2) a polyahl;

(b) a curing amount of a polymerization initiator; and

(c) a stabilizing amount of an inhibitor.

4,320,222

STORAGE-STABLE PRECATALYZED POLYEPOXIDE COMPOSITIONS

John A. Lopez, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 10, 1980, Ser. No. 139,055

Int. Cl.³ C08G *59/62, 59/68*

U.S. Cl. 528—89 10 Claims

1. A pre-catalyzed epoxy resin composition comprising (A) a polyepoxide and (B) a catalyst combination comprising (1) from about 0.05% to about 5.0% by weight of a phosphonium halide and (2) from about 0.01% to about 1.0% by weight of an alkali metal hydroxide or halide, based on the polyepoxide.

4,320,223

MOLDED EPOXY RESIN PRODUCT CONTAINING ACIDS FROM OXIDATION OF CARBONACEOUS MATERIALS AND PROCESS FOR PRODUCING SAME

Johann G. Schulz, Pittsburgh; Walter P. Barie, Jr., Glenshaw, and James T. Eurich, Marwood, all of Pa., assignors to Gulf Research & Development Corp., Pittsburgh, Pa.

Filed Nov. 24, 1980, Ser. No. 209,595

Int. Cl.³ C08G *59/42*

U.S. Cl. 527—501 16 Claims

1. A process for preparing a molded resin product which comprises subjecting a curable mixture comprising:

(a) a 1,2-epoxy resin containing on the average more than one 1,2-epoxy group per molecule;

(b) a mixture of polycyclic, aromatic, polycarboxylic acids obtained from the aqueous nitric acid oxidation of naturally occurring solid carbonaceous material;

(c) an accelerator;

to a temperature of about 50° to about 150° C. for about five minutes to about 6 hours and thereafter subjecting the resulting composition to molding conditions.

4,320,224

THERMOPLASTIC AROMATIC POLYETHERKETONES

John B. Rose, Letchworth, and Philip A. Staniland, Tewin Wood, both of England, assignors to Imperial Chemical Industries Limited, London, England

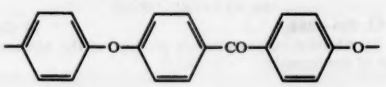
Continuation-in-part of Ser. No. 873,477, Jan. 30, 1978, abandoned. This application Oct. 31, 1978, Ser. No. 956,045

Claims priority, application United Kingdom, Sep. 7, 1977, 37345/77; Jan. 13, 1978, 1412/78

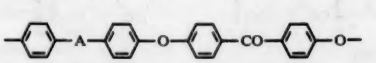
Int. Cl.³ C08G *65/40*

U.S. Cl. 528—125 11 Claims

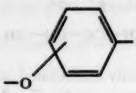
1. A tough crystalline thermoplastic aromatic polyetherketone containing the repeat unit I



alone or in conjunction with other repeating units selected from the group consisting of the repeating units IV



where A is a direct link, oxygen, sulphur, $—SO_2—$, —CO—, or a divalent hydrocarbon radical, the oxygen atoms in the sub-units



are ortho or para to the groups Q and Q', Q and Q' which may be the same or different are —CO— or —SO_2—, Ar' is a divalent aromatic radical, and n is 0, 1, 2 or 3, said polymer having an inherent viscosity IV, as measured at 25° C. on a solution of the polymer in concentrated sulphuric acid of density 1.84 g.cm^3 said solution containing 0.1 g of polymer in 100 cm^3 of solution, of at least 0.7 (which corresponds to a reduced viscosity RV, as measured at 25° C. on a solution of the polymer in concentrated sulphuric acid of density 1.84 g.cm^3 said solution containing 1 g of polymer in 100 cm^3 of solution, of at least 0.8.

4,320,225

PERIANDRINS EXTRACTED FROM PLANTS OF THE GENUS PERIANDRA

Yohei Hashimoto, 44, Kasumi-Cho 5-Chome, Nishinomiya-Shi, Hyogo-Ken, Japan; Masaru Ogura, Choshi, and Hiroyuki Ishizone, Koganei, both of Japan, assignors to Yamasu Shoyu Kabushiki Kaisha, Chiba and Yohei Hashimoto, Hyogo, both of, Japan

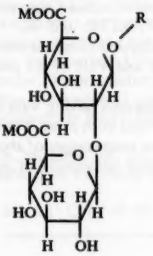
Continuation-in-part of Ser. No. 90,308, Nov. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 28,800, Apr. 10, 1979, abandoned. This application Dec. 23, 1980, Ser. No. 219,538

Claims priority, application Japan, Apr. 14, 1978, 53/43198; Jan. 9, 1979, 54/404; Jan. 9, 1979, 54/405; Mar. 2, 1979, 54/23413

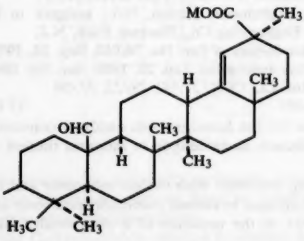
Int. Cl.³ C07H *15/20, 15/24*

U.S. Cl. 536—4 **7 Claims**

1. A periandrin which is a glycoside represented by the formula

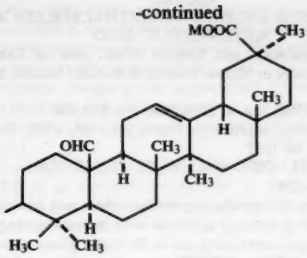


wherein R is a substituent selected from the group consisting of substituents respectively represented by the formulas:

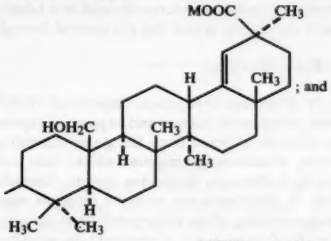


(I)

-continued

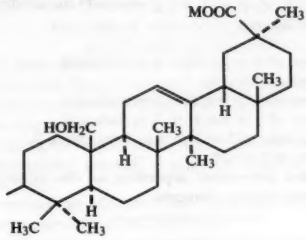


(II)



(III)

; and



(IV)

where each M is selected from the group consisting of hydrogen and cations substantially non-toxic to humans.

4,320,226

WATER SOLUBLE GUAR PRODUCT AND METHOD FOR MAKING IT

Karl H. O. Tiefenthaler, and Ulrich Wyss, both of Kreuzlingen, Switzerland, assignors to Meyhall Chemical A.G., Kreuzlingen, Switzerland

Filed Oct. 9, 1980, Ser. No. 195,583

Claims priority, application Switzerland, Dec. 3, 1979, 10719/79

Int. Cl.³ C08B *37/00*

U.S. Cl. 536—114 **7 Claims**

1. A water soluble depolymerized phosphated guar gum having a degree of substitution of about 0.1 to about 0.5 and a viscosity as a 2 weight percent solution in water of about 50 to about 4,000 mPa.s.

3. A method for making water soluble phosphated guar comprising phosphating guar to a degree of substitution of about 0.1 to about 0.5 and depolymerizing the phosphated guar to render it water soluble wherein the phosphating step is conducted by reacting guar gum with an alkali metal phosphate in water at a pH of about 4.5 to about 8 and at a temperature of about 130° C. to about 180° C. and wherein the depolymerization reaction is conducted under alkaline conditions with an oxidizing agent at a temperature of about 70° C. to about 90° C.

4,320,227
PROCESS FOR PRODUCING METHACROLEIN AND METHACRYLIC ACID

Mutsumi Matsumoto, and Kouichi Wada, both of Takasaki, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 4, 1980, Ser. No. 109,554

Claims priority, application Japan, Jan. 23, 1979, 54-5584; Jan. 26, 1979, 54-7192

Int. Cl.³ C07C *45/65, 47/22, 51/235, 57/05*

U.S. Cl. 562—534 **4 Claims**

1. A process for producing methacrolein and methacrylic acid by oxidizing isobutyl aldehyde with molecular oxygen or molecular oxygen-containing gas in the vapor phase characterized by the use of a catalyst of heteropoly-acid or a mixture of heteropoly-acid and its salt which has the general formula:

$$Mo_aV_bP_cCu_dX'_eY'_fO_g,$$

wherein, Mo, V, P, Cu and O represent respectively molybdenum, vanadium, phosphorus, copper and oxygen, X' represents one or more elements selected from the group consisting of arsenic, thorium, aluminum, germanium, nickel, iron, cobalt, zinc, titanium, lead, rhenium, zirconium, cerium, bismuth, tin and chromium, Y' represents one or more elements selected from the group consisting of potassium, rubidium, cesium and thallium and a', b', c', d', e', f' and g' represent the atomic ratio of the elements where,

a' is 10,

b' is a number of 6 or less than 6 excluding 0,

c' is a number of 0.5 to 6,

d' is a number of 3 or less than 3 excluding 0,

e' is a number of 3 or less than 3 excluding 0,

d'+e' is a number of 3 or less than 3 excluding 0,

f' is a number of 0 to 0.8,

g' is a number determined depending on the valency and atomic ratio of other elements.

4,320,228
PREPARATION OF OLEFINICALLY UNSATURATED CARBONYL COMPOUNDS AND ALCOHOL

Michael Horner, Neustadt; Matthias Irgang, Mannheim, and Axel Nissen, Leimen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

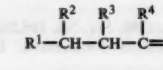
Filed Jul. 8, 1980, Ser. No. 166,858

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934250

Int. Cl.³ C07C *47/21, 29/17*

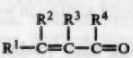
U.S. Cl. 568—459 **7 Claims**

1. A process for the preparation of olefinically unsaturated carbonyl compounds of the formula I



I

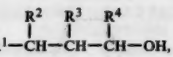
where R^1 is an olefinically unsaturated organic radical and R^2, R^3 and R^4 are hydrogen or C_1–C_4-alkyl, which comprises: hydrogenating an α,β-unsaturated carbonyl compound III



III

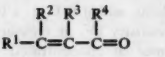
in the liquid phase by means of hydrogen in the presence of a catalyst system comprising, firstly, palladium, and, secondly, ruthenium, rhodium, osmium, iridium or platinum, as the active constituents, and of from 5 to 40% by weight, based on the amount of III, of a tertiary amine, wherein a hydrogen pressure of from 1 to about 20 bar is used.

4. A process for the preparation of olefinically unsaturated alcohols of the formula



II

where R^1 is an olefinically unsaturated organic radical and R^2, R^3 and R^4 are hydrogen or C_1–C_4-alkyl which comprises hydrogenating an α,β-unsaturated carbonyl compound III



III

in the liquid phase by means of hydrogen in the presence of a catalyst system comprising, firstly, palladium, and, secondly, ruthenium, rhodium, osmium, iridium or platinum, as the active constituents, and of from 5 to 40% by weight, based on the amount of III, of a tertiary amine, wherein a hydrogen pressure of from about 20 to 150 bar is used.

4,320,229
PREPARATION OF ALIPHATIC ALDEHYDES FROM ESTERS

Frank G. Young, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 4, 1980, Ser. No. 204,023

Int. Cl.³ C07C *45/27, 47/02*

U.S. Cl. 568—484 **10 Claims**

1. Method of preparing aliphatic aldehydes from carboxylic acid esters of primary alcohols having the formula

$$RCH_2COOCH_2CH_2R$$

where R is hydrogen or an alkyl group having 1 to about 18 carbon atoms, which comprises contacting said ester with a catalyst composition having the formula

$$X_aY_b$$

where X is one or more oxidized elements selected from the group consisting of V, Sb, Mo and W,

Y is one or more oxidized elements selected from Groups I, III-B, IV, VII-A and VIII of the periodic system of elements, and

a and b are each integers having values of 0 to 6 inclusive with the proviso that both a and b cannot be 0 at the same time, at a reaction temperature of about 50° to about 500° C. until the desired conversion of ester to aldehyde occurs.

4,320,230
METHANOL HOMOLOGATION USING IRON-COBALT CARBONYL CLUSTER CATALYST

Gerald Doyle, Whitehouse Station, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 78,563, Sep. 24, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 180,863

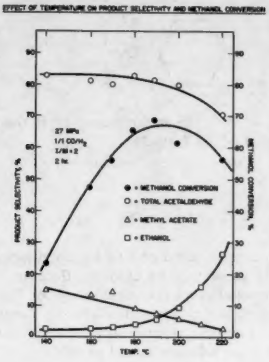
Int. Cl.³ C07C *27/00, 29/32, 47/06*

U.S. Cl. 568—487 **17 Claims**

1. A process for the homogeneous catalytic conversion of methanol to ethanol, acetaldehyde or mixtures thereof which comprises:

(a) contacting methanol with carbon monoxide and hydrogen at a hydrogen to carbon monoxide mole ratio of from 1:10 to 10:1 in the presence of a catalytically effective

amount of an iron-cobalt carbonyl cluster complex and an effective amount of an iodide promoter; and



(b) heating the mixture of step (a) to a temperature of about 100° to 250° C. at a pressure of from 5 to 100 MPa.

4,320,231
AQUEOUS SOLUTIONS OF DIALDEHYDES AND KETONES

Gerald J. Murphy, Wappinger Falls, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

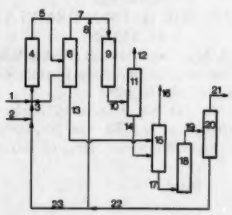
Filed Nov. 20, 1980, Ser. No. 208,810
Int. Cl.³ C07C *45/78, 47/12*
U.S. Cl. 568—494 **6 Claims**

1. An aqueous solution comprising a saturated dialdehyde containing from 2 to 6 carbon atoms and from about 5 to about 40 percent by weight of an aliphatic ketone containing from 3 to 6 carbon atoms.

4,320,232
PROCESS FOR CONJOINTLY PREPARING METHYL TERT.-BUTYL ETHER AND OBTAINING ISOBUTENE

Klaus Volkamer, Frankenthal; Alfred Lindner, Bobenheim-Roxheim; Franz Merger, Frankenthal; Ulrich Wagner, Limburgerhof; Erwin Brunner, Ludwigshafen; Gerhard Sandrock, Frankenthal, and Max Strohmeyer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 19, 1980, Ser. No. 161,041
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928509
Int. Cl.³ C07C *41/06*
U.S. Cl. 568—697 **12 Claims**



1. A process for conjointly preparing methyl tert.-butyl ether and obtaining isobutene from an isobutene-containing C_4-hydrocarbon mixture wherein

(a) the C_4-hydrocarbon mixture is reacted, in one or more etherification stages, with methanol and a primary C_3- or C_4-alcohol in the presence of an acid condensing agent,

(b) the resulting reaction mixture or the resulting reaction mixtures are then separated into

a fraction containing the unconverted hydrocarbons,

the methyl tert.-butyl ether and

a fraction containing the C_3- or C_4-alkyl tert.-butyl ether and

(c) thereafter the C_3- or C_4-alkyl tert.-butyl ether is decomposed at an elevated temperature, in the presence of an acid catalyst, into isobutene and primary C_3- or C_4-alcohol.

4,320,233
DIALKYL ETHER PRODUCTION

Donald J. Makovec, and Paul D. Hann, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 9, 1981, Ser. No. 232,791
Int. Cl.³ C07C *41/05, 2/60*
U.S. Cl. 568—697 **11 Claims**

1. A process for producing a dialkyl ether by exothermic reaction of isoolefin and alkanol in contact with catalyst, said process comprising

(a) passing a stream comprising isoolefin, alkanol and diluent sequentially through a series of zones containing said catalyst,

(b) cooling the effluent of any zone prior to or during the entry thereof into the next zone,

(c) adding at least one of isoolefin and alkanol to the effluent from one of said zones prior to or during the entry thereof into the next zone.

9. A process to convert isobutylene into two high octane gasoline blending materials comprising

(A) producing MTBE by

(a) passing a stream comprising isobutylene, methanol and hydrocarbon diluent containing isobutane sequentially through a series of zones containing a catalyst for converting isoolefin and alkanol to dialkyl ether,

(b) cooling the effluent of any zone prior to or during the entry thereof into the next zone,

(c) adding at least one of isobutylene and methanol to the effluent from one zone prior to or during the entry thereof to the next zone,

with the proviso that the total quantity of isobutylene employed in the multizone process exceeds stoichiometrically the total quantity of methanol employed so that the effluent from the last zone is substantially free of methanol,

(d) passing the effluent from the last zone to a fractionation zone to yield a bottom stream containing MTBE and an overhead stream containing isobutylene and isobutane,

(B) producing a high octane alkylate by

(a) introducing said overhead stream as at least a portion of the isoolefin feedstock to an HF alkylation zone,

(b) introducing an olefin and HF alkylation catalyst to said HF alkylation zone to produce an alkylation mixture,

(c) withdrawing after reaction said alkylation mixture and separating it into a catalyst phase and a hydrocarbon phase, and

(d) recovering alkylate as the second product of the process from said hydrocarbon phase.

4,320,234
PROCESS FOR PURIFYING CRUDE DIPHENOLS

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Continuation of Ser. No. 41,641, May 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 755,982, Dec. 30, 1976, abandoned. This application Jun. 6, 1980, Ser. No. 156,953

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2758565; France, Dec. 28, 1977, 77 39515; Japan, Dec. 28, 1977, 52/157557; Netherlands, Dec. 29, 1977, 14564

Int. Cl.³ C07C *39/16*

U.S. Cl. 568—724 **4 Claims**

1. A process for purifying crude diphenol, said crude diphenol comprising 2,2-bis(4-hydroxyphenyl) propane and impurities which are more soluble than the 2,2-bis(4-hydroxyphenyl) propane and impurities which are less soluble than the 2,2-bis(4-hydroxyphenyl) propane in a water polyhydroxylic alcohol solvent system to recover the purified 2,2-bis(4-hydroxyphenyl) propane which comprises

(a) dispersing the crude, untreated diphenol in a solvent system consisting of water and a polyhydroxylic alcoholic co-solvent or mixture of co-solvents at a temperature of from about 90° to about 100° C., measured at atmospheric pressure, until near dissolution of said crude diphenol results and the 2,2-bis(4-hydroxyphenyl) propane and the more soluble impurities are dissolved in said solvent system, the weight ratio of said co-solvent or said mixture of co-solvents to said water plus crude diphenol being in the range of about 10–40:100;

(b) removing the less soluble impurities from the solvent system; and

(c) cooling the solvent system to a temperature wherein the purified 2,2-bis(4-hydroxyphenyl) propane is separated from the more soluble impurities.

4,320,235
PREPARATION OF 1-(ARALKYL)-2-NAPHTHOLS

Franz Merger, Frankenthal, and Gerhard Nestler, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

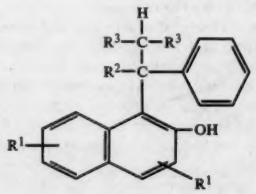
Filed Nov. 21, 1980, Ser. No. 209,280

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 2950290

Int. Cl.³ C07C *39/12, 39/14*

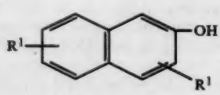
U.S. Cl. 568—736 **6 Claims**

1. A process for the preparation of 1-(aralkyl)-2-naphthols of the formula



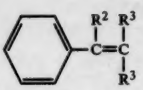
I

where the individual radicals R^1, R^2 and R^3 may be identical or different and each is hydrogen or an aliphatic radical, and R^1 may also be alkoxy or halogen, by reacting a naphthol with an olefin in the presence of an acid wherein a 2-naphthol of the formula



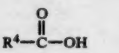
II

where R^1 has the above meanings, is reacted with a styrene of the formula



III

where R^2 and R^3 have the above meanings, in the presence of a carboxylic acid of the formula



IV

where R^4 is hydrogen, alkyl of 1 to 8 carbon atoms, which is unsubstituted or substituted by chlorine, fluorine, cyano, nitro and/or an additional carboxyl, alkylphenyl of 7 to 12 carbon atoms, or phenyl, the above radicals being unsubstituted or substituted by bromine, chlorine, alkyl of 1 to 4 carbon atoms, cyano, carboxyl, carbalkoxy, acetyl or nitro.

4,320,236
ETHYNYLATION

Hermann Wiederkehr, Flüh, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

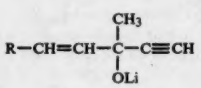
Filed Sep. 19, 1980, Ser. No. 188,640

Claims priority, application Switzerland, Oct. 19, 1979, 9419/79

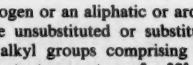
Int. Cl.³ C07C *33/28*

U.S. Cl. 568—813 **15 Claims**

1. A process for producing a compound of the formula:



wherein R is hydrogen or an aliphatic or aromatic hydrocarbon which can be unsubstituted or substituted with lower alkoxy or lower alkyl groups comprising ethynylating by reacting acetylene, at a temperature of −30° to +30° C., with a ketone of the formula



wherein R is as above in an inert organic solvent containing a suspension of a monolithium acetylide-ammonia complex composition.

4,320,237
PROCESS FOR THE HYDROFORMYLATION OF OLEFINS

Manfred Kaufhold, Marl, and Johann Gaube, Rösdorf, both of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Division of Ser. No. 711,460, Aug. 4, 1976, abandoned. This application Apr. 7, 1978, Ser. No. 894,325

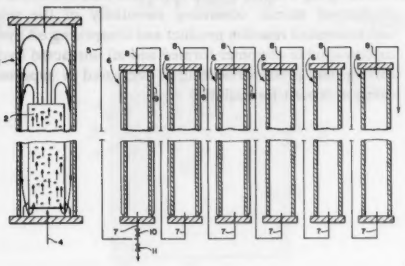
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1975, 2538037

Int. Cl.³ C07C *27/22*

U.S. Cl. 568—909 **15 Claims**

1. In the process for the hydroformylation of olefins with carbon monoxide and hydrogen in the presence of soluble cobalt compounds as a catalyst at an elevated temperature and under increased pressure, the improvement comprising conducting said hydroformylation in a first stage with remixing of a reaction mixture comprising said olefins, carbon monoxide

and hydrogen for a first period of time sufficient to produce an olefin conversion of about 40–75 percent as a converted product and then in a second stage continuing said hydroformylation of said converted product without remixing for a second period of time sufficient to produce an olefin conversion of



about 95–98 percent, said olefins having 6 or more carbon atoms and selected from the group consisting of alpha olefins, olefins having internally positioned double bonds, olefins with branches in the carbon chain, olefins having branches in the carbon chain and internally positioned double bonds and mixtures of said olefins.

4,320,238

HIGH DENSITY TURBINE FUEL

Richard V. Norton, Dublin, and Steven C. Howe, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 21, 1980, Ser. No. 180,182
Int. Cl.³ C07C *13/28*
U.S. Cl. 585—14 **4 Claims**

1. A high density liquid hydrocarbon fuel consisting essentially of from 99.9 to 95 weight percent of exo-tetrahydrodicyclopentadiene and correspondingly from 0.1 to 5.0 weight percent of a C_3–C_7 cyclic or acyclic alkane.

4,320,239

REACTION PRODUCTS OF AN OLEFIN, A NORBORNENE AND A CYCLOPENTADIENE

Wolfgang Schneider, Brosdview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 13, 1981, Ser. No. 234,277
Int. Cl.³ C07C *13/42, 13/48*
U.S. Cl. 585—360 **12 Claims**

1. A process for preparing a product mixture containing a norbornene and a tetracyclododecene in a desired molar ratio which is in the range of about 95/5 to 5/95 comprising heating in a reactor an olefin of 2 to 22 carbon atoms, a cyclopentadiene or a dicyclopentadiene, and a norbornene; maintaining ratio of reactants, temperature, pressure, and residence time in the reactor such that formation of the norbornene and the tetracyclododecene is favored; and recovering the norbornene and the tetracyclododecene from the product mixture.

4,320,240

STEAM DEHYDROCYCLIZATION OF PARAFFINIC HYDROCARBONS IN THE PRESENCE OF CATALYST CONTAINING GROUP VIII METAL AND AN ACTIVATING AMOUNT OF A GROUP I B METAL

Richard F. Love, Fishkill; Tansukhlal G. Dorawala, and Edwin R. Kerr, both of Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 13, 1979, Ser. No. 103,303
Int. Cl.³ C10G *35/09*
U.S. Cl. 585—419 **24 Claims**

1. The process for steam dehydrocyclizing a dehydrocyclizable hydrocarbon which comprises contacting said dehydrocyclizable hydrocarbon and steam at steam dehydrocyclization conditions with a reduced catalyst containing a porous support, a catalytic amount of a Group VIII metal, and an activating amount of a Group I B metal.

4,320,241

PROCESS FOR CONVERTING OXYGENATED HYDROCARBONS INTO HYDROCARBONS

Theodore C. Frankiewicz, Westminster, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Aug. 28, 1980, Ser. No. 182,291
Int. Cl.³ C07C *1/20, 1/00*
U.S. Cl. 585—469 **14 Claims**

1. A process for converting oxygenated hydrocarbons into hydrocarbons which comprises the step of contacting said oxygenated hydrocarbons with a catalyst comprising an admixture of a crystalline aluminosilicate zeolite and a low surface area, low acidity diluent, said diluent being characterized as having a surface area of less than about 25 m^2/gm and Hammet acid function value of at least about 3, at conditions sufficient to convert at least a portion of said oxygenated hydrocarbons into hydrocarbons.

4,320,242

PROCESS FOR SELECTIVE DEALKYLATION OF ALKYL-SUBSTITUTED AROMATIC HYDROCARBONS

Tamio Onodera; Tokuji Sakai; Yasuo Yamasaki; Koji Sumitani, all of Matsuyama, and Minekazu Sueoka, Hino, all of Japan, assignors to Teijin Petrochemical Industries Ltd., Tokyo, Japan

Filed Feb. 4, 1980, Ser. No. 118,324
Claims priority, application Japan, Sep. 21, 1979, 54-120805
Int. Cl.³ C07C *4/12*
U.S. Cl. 585—489 **15 Claims**

1. In a process for dealkylating a hydrocarbon material containing at least one alkyl-substituted aromatic hydrocarbon having bonded to the aromatic ring at least one alkyl group with at least 2 carbon atoms in the gaseous phase in the presence of hydrogen using a hydro-dealkylation catalyst, the improvement wherein (a) said hydro-dealkylation catalyst in composed of a crystalline aluminosilicate having high acid activity, having a silica/alumina mole ratio of from 20 to 200, and containing a noble metal selected from platinum, palladium, rhodium and iridium, and (b) said dealkylation is carried out at a temperature of 250° C. to 420° C. and a pressure of not more than 100 psig, with the provisos that when the noble metal is platinum, said noble metal is present in the catalyst in an amount of from 0.001 to 0.5% by weight and when the noble metal is palladium, rhodium or iridium, said noble metal is present in the catalyst in an amount of from 0.001 to 2% by weight, based on the weight of the aluminosilicate, thereby selectively removing said alkyl group containing at least 2 carbon atoms from said alkyl-substituted aromatic hydrocarbon with substantial inhibition of the hydrogenation of the aromatic ring.

4,320,243

PROCESS FOR PRODUCING PROPENE AND/OR BUTENE OLIGOMERS

Yves Chauvin, Le Pecq; Jean Gaillard, Lyons; Gerard Leger, Saint Genis les Ollieres, and Hugo Van Landeghem, Oytier Saint Oblas, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Mar. 27, 1979, Ser. No. 24,335
Claims priority, application France, Mar. 28, 1978, 78 09197
Int. Cl.³ C07C *2/02*
U.S. Cl. 585—521 **10 Claims**

1. A process for producing at least one hydrocarbon-soluble oligomer, while decreasing or suppressing the formation of black sticky catalyst deposit formation on reactor walls, which process comprises:

(a) feeding a liquid hydrocarbon charge comprising at least

one olefinic hydrocarbon selected from propene and the butenes with an oligomerization catalyst dispersed in said charge into at least one elongated, substantially cylindrical reaction zone, at an hourly feed rate of at least 5 liters of said liquid charge per liter of reaction space in said reaction zone and at an average residence time of said olefinic hydrocarbon from 0.5 to 10 hours, said feeding being effected at least partly in a tangential direction, to thereby give to said liquid charge a circular motion in the reaction zone, and said reaction zone being maintained at liquid phase oligomerization conditions of temperature and pressure, said oligomerization catalyst being a material obtained by reacting at least one nickel compound with at least one hydrocarbyl aluminum halide,

(b) displacing said liquid hydrocarbon charge axially in said reaction zone, thereby adding a translation motion to the circular motion of said charge, and

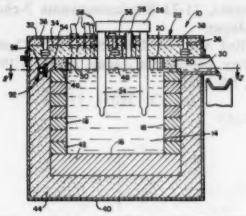
(c) discharging a liquid stream from said reaction zone, said discharged stream consisting essentially of the whole unfractionated reaction product and comprising all hydrocarbon-soluble oligomer formed and all unreacted hydrocarbon, said process resulting in decreased or suppressed catalyst deposit formation.

4,320,244

MELTING FURNACE FOR THE PRODUCTION OF MINERAL WOOL INSULATION

Robert Dejaiffe, Aurora, and Edward L. Kells, Batavia, both of Ill., assignors to Forty-Eight Insulations, Inc., Aurora, Ill.

Filed Feb. 29, 1980, Ser. No. 125,798
Int. Cl.[3] C03B 5/02
U.S. Cl. 13—6 16 Claims



1. A glass melting furnace comprising:

top, bottom and side walls to define a melt chamber, each of said bottom and side walls including a substantially sealed external shell and a carbon lining of sufficient thickness to inhibit the transfer of heat from a liquid melt contained in said chamber;

electric means for heating the liquid melt contained in said chamber; and

means to maintain the top of said liquid melt at a predetermined substantially constant distance from the bottom of said chamber;

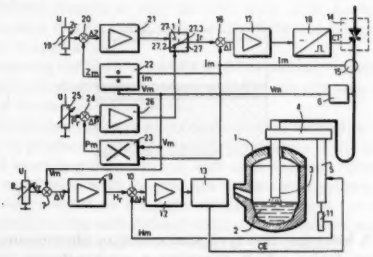
said carbon lining extending from said bottom wall upwardly along said sidewalls and terminating at an upper edge lying at a plane defined by the top of said liquid melt.

4,320,245

PROCESS AND APPARATUS FOR ARC CONTROL IN ARC FURNACES

Jean P. Gaydon, Marly le Roi, and Claude Haglon, La Garenne, both of France, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 16, 1980, Ser. No. 169,463
Claims priority, application France, Jul. 17, 1979, 79 18726
Int. Cl.[3] H05B 7/144
U.S. Cl. 13—12 7 Claims



1. An arc control device for use with an arc furnace, comprising:

at least one movable electrode located in said furnace, said at least one electrode producing an arc;

power network means coupled to said at least one electrode for supplying DC electric power to said at least one electrode;

first control circuit means for modifying the location of said at least one movable electrode as a function of at least one measurement signal representing a first electrical characteristic of said arc;

thyristor converter means coupled between an output of said power network means and said at least one electrode for modifying an arc voltage of said DC electric power supplied to said at least one electrode by said power network means, said thyristor converter means including at least one thyristor having a gate; and

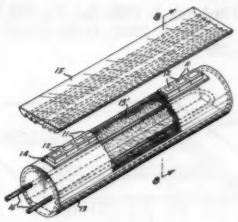
second control circuit means independent of said first control circuit means, said second control circuit means having at least one output coupled to said gate of said at least one thyristor, and including as inputs at least one measurement signal representing a second electrical characteristic of said arc and a reference signal associated with said at least one measurement signal.

4,320,246

UNIFORM SURFACE TEMPERATURE HEAT PIPE AND METHOD OF USING THE SAME

George F. Russell, 8513 - 42nd Ave. West, Tacoma, Wash. 98466

Continuation-in-part of Ser. No. 902,700, May 4, 1978, abandoned, and a continuation-in-part of Ser. No. 788,437, Apr. 18, 1977, abandoned. This application Jul. 19, 1979, Ser. No. 58,904
Int. Cl.[3] H01L 31/04; F24J 3/02
U.S. Cl. 136—248 7 Claims



1. Apparatus for collecting and converting solar energy comprising a plurality of separate elongated substantially straight cylindrical tubes arranged in side-by-side relationship with their axes substantially coplanar, spaced apart transversely of their lengths a distance less than the radius of one of said tubes, with the plane of the axes of said tubes disposed generally perpendicular to the rays of the sun and with the axis of each tube horizontal, the length of each tube being a multiplicity of times as great as its diameter, each tube being sealed and having a heat-conductive portion forming an exterior energy-collecting surface for receiving insolation and located sufficiently close to the exterior energy-collecting surface of an adjacent tube that at least a substantial portion of the energy not absorbed by said heat-conductive portion and reflected from each tube impinges on and is absorbed by the heat-conductive portion of an adjacent tube, a body of vaporizable heat transfer fluid liquid within the bottom portion of each tube, a wick within each tube including a first portion in contact with said vaporizable liquid and a second portion connected to said first portion and lining the major part of said energy-collecting heat conductive tube portion in intimate heat-conducting contact therewith, cooling conduit means for each tube extending from outside of such tube into such tube above said liquid body in the bottom of such tube and axially substantially throughout the length of such tube substantially in its horizontal diametral plane for utilizing energy collected by said energy-collecting surface to vaporize liquid from said second portion of said wick to be condensed subsequently by transfer of heat to fluid in said cooling conduit means for return to said liquid body in the bottom of such tube and thereby heat said cooling means fluid, each of said cooling conduit means including a first conduit portion for conveying fluid coolant lengthwise of its tube in one direction through substantially the entire

length of the energy-collecting heat-conductive portion of such tube and a second conduit portion for conveying fluid coolant lengthwise of such tube in the opposite direction through substantially the entire length of the energy-collecting heat-conductive portion of such tube for maintaining substantially all portions of the energy-collecting surface of such tube at a substantially uniform temperature, fluid supply means connecting said first conduit portions of said cooling conduit means for said plurality of tubes in parallel for inflow of cooling fluid at substantially the same temperature to all of said first conduit portions, and fluid discharge means connecting said second conduit portions of said cooling conduit means for said plurality of tubes in parallel for receiving heated fluid from all of said second conduit portions to circulate cooling fluid through said cooling conduit means.

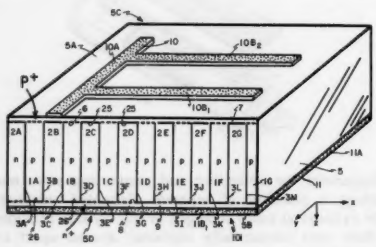
2. The apparatus defined in claim 1, and a row of photovoltaic cells mounted on and extending throughout substantially the entire length of the energy-collecting heat-conductive portion of each tube and being in heat-conducting relation thereto.

4,320,247

SOLAR CELL HAVING MULTIPLE P-N JUNCTIONS AND PROCESS FOR PRODUCING SAME

Harry C. Gatos, Weston, and Jim-Yong Chi, Bedford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 6, 1980, Ser. No. 175,728
Int. Cl.³ H01L *31/06, 31/18*
U.S. Cl. 136—255 **18 Claims**



1. A process for fabricating multiple p-n junctions from a silicon crystal pulled from the melt, that comprises: forming a slice of the silicon crystal along the pulling direction; heat treating the slice at a temperature that is high enough to activate oxygen donor states in the slice and for a time period sufficient for activation to occur and at the maxima of the oxygen concentration to overcompensate the background p-type dopant present in the ordinary silicon crystal and lead to n-type regions, each n-type region being adjacent to a p-type region with a p-n junction therebetween; and applying electrical contacts selectively to the p-type regions and the n-type regions to permit collection of charge carriers therein.

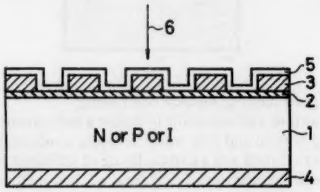
10. A semiconductor device that comprises: a plurality of p-regions and a plurality of n-regions in a structure in which the p-regions and n-regions are located along one direction such that a p-region is positioned between two n-regions and vice versa, with a p-n junction between each p-region and the adjacent n-regions and vice versa; a p+ diffusion region at one surface of the device in electrical contact with the p-regions at one transverse end of each p-region; an n+ diffusion region at another surface of the device in electrical contact with the n-regions at one transverse end of each n-region; first electrode means in electrical contact with the p+ diffusion region; and second electrode means in electrical contact with the n+ diffusion region, said p-regions and said n-regions occurring in a single as grown silicon crystal that is grown along said one direction and is doped with a p-type material to produce said p-regions and where said n-regions are striations of maxima of oxygen concentration occurring in said p-doped silicon crystal that are heat treated to activate oxygen donor states.

4,320,248

SEMICONDUCTOR PHOTOELECTRIC CONVERSION DEVICE

Shunpei Yamazaki, 21-21 Kitakarasuyama 7-chome, Setagaya-ku, Tokyo, Japan

Filed Aug. 12, 1980, Ser. No. 177,407
Claims priority, application Japan, Aug. 13, 1979, 54/102905; Aug. 13, 1979, 54/102906
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—255 **3 Claims**



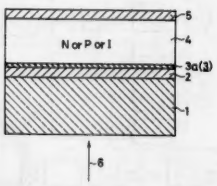
1. A semiconductor photoelectric conversion device which comprises a semiconductor layer, a conductive layer having a comb- or grid-like pattern formed on the semiconductor layer, and an anti-reflecting layer formed on the semiconductor layer, characterized in that the anti-reflecting layer comprises a conductive metal nitride.

4,320,249

HETEROJUNCTION TYPE SEMICONDUCTOR PHOTOELECTRIC CONVERSION DEVICE

Shunpei Yamazaki, 21-21 Kitakarasuyama 7-chome, Setagaya-ku, Tokyo, Japan

Filed Aug. 12, 1980, Ser. No. 177,408
Claims priority, application Japan, Aug. 13, 1979, 54-102905; Aug. 13, 1979, 54-102906
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—255 **8 Claims**



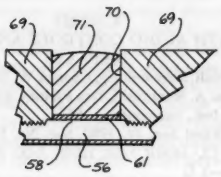
1. A heterojunction type semiconductor photoelectric conversion device which comprises a semiconductor layer, a light-transparent, conductive layer disposed on the semiconductor layer to form therebetween a heterojunction having a barrier, and a conductive layer disposed on the semiconductor layer on the opposite side from the light-transparent, conductive layer, characterized in that a light-transparent, current-permeable nitride layer is formed in the barrier of the heterojunction provided between the semiconductor layer and the light-transparent, conductive layer, the light-transparent, current-permeable nitride layer being insulating or semi-insulating and formed of a silicon nitride and a conductive metal nitride.

4,320,250

ELECTRODES FOR CONCENTRATOR SOLAR CELLS, AND METHODS FOR MANUFACTURE THEREOF

Rudolph E. Corwin, Seattle; Dietrich E. Riemer, Auburn, and Billy J. Stanbery, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 17, 1980, Ser. No. 169,756
Int. Cl.[3] H01L *31/04, 31/18*
U.S. Cl. 136—256 21 Claims



1. The method of forming a highly efficient concentrator solar cell or the like having fine-line current carrying electrodes formed on a surface thereof with such electrodes having a width on the order of less than about 1.0 mils and a minimum thickness at least equal to the width thereof, comprising the steps of:

(a) preparing a semiconductor substrate having at least one impurity dispersion zone formed on one surface thereof and a fine-line, grid-like contact area pattern formed thereon with such fine-line, grid-like pattern defined by contact areas of on the order of less than about 1.0 mils in width;

(b) laminating a photoresist mask to the semiconductor substrate formed in step (a) with such mask having a thickness at least equal to the width of the fine-line, grid-like contact areas;

(c) exposing the mask to form a grid-like pattern thereon in registration with the fine-line, grid-like contact area pattern formed on the substrate;

(d) developing the exposed grid-like pattern formed in step (c) to produce a grid-like pattern of openings in the mask and extending therethrough with such openings (i) being in registration with the grid-like contact area pattern, (ii) having a width on the order of less than about 1.0 mils, and (iii) having well-defined vertical edge contours with a height at least equal to the width of said openings;

(e) applying a metallic electroplated electrode to the exposed contact areas on the substrate through the openings formed in the photoresist mask with the metallic electroplated electrode having a width on the order of less than about 1.0 mil, a thickness at least equal to the width thereof, and well-defined, sharp, vertically oriented electrode edge contours; and,

(f) removing the photoresist mask laminate from the concentrator solar cell substrate.

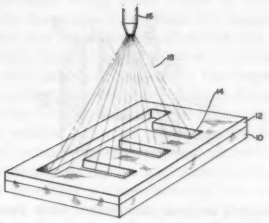
2. The concentrator solar cell produced by the method set forth in claim 1.

4,320,251

OHMIC CONTACTS FOR SOLAR CELLS BY ARC PLASMA SPRAYING

Mandayam C. Narasimhan, Seekonk, Mass.; Barton Roessler, Barrington, and Joseph J. Loferski, Providence, both of R.I., assignors to Solamat Inc., East Providence, R.I.

Filed Jul. 28, 1980, Ser. No. 173,198
Int. Cl.[3] H01L *31/06, 31/18;* B05D *1/08*
U.S. Cl. 136—256 19 Claims



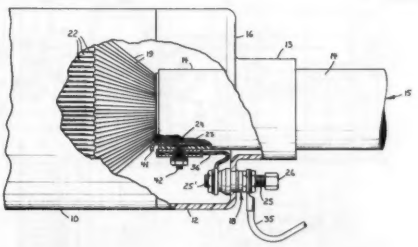
12. A p-n junction solar cell having arc plasma sprayed ohmic contacts on the p side or n side of the junction, the thickness of said contact being in the range of from about 5 to about 40 microns.

4,320,252

TELECOMMUNICATION CABLE CLOSURE

James R. Holman, Gwinnett County, and Robert N. McIntyre, DeKalb County, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Sep. 5, 1980, Ser. No. 184,564
Int. Cl.[3] H02G *15/24*
U.S. Cl. 174—21 R 5 Claims



1. A pressurizable closure for a telecommunication cable comprising, in combination, a hollow body adapted to be placed about and sealed to an end of at least one cable; a metallic valve extending through a wall of said hollow body through which valve a pressurizing fluid may be introduced into said body; first means for electrically coupling a portion of said metallic valve located inside said hollow body with an electrically conductive component of the cable housed within said hollow body; and second means for electrically coupling a portion of said metallic valve located outside said hollow body with an extrinsic electrical grounding element.

4,320,253
CERAMIC BEADS FOR HEATERS

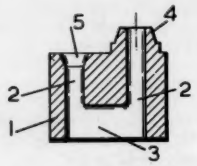
Joseph Fisher, 52 Southover, Daisy Hill, Westhoughton, Bolton, Lanchasire, England

Continuation of Ser. No. 79,060, Sep. 26, 1979, Pat. No. 4,255,649. This application Aug. 29, 1980, Ser. No. 182,661

Claims priority, application United Kingdom, Sep. 29, 1978, 38749/78

Int. Cl.³ H01B *17/56*; H05B *3/02*

U.S. Cl. 174—138 J **2 Claims**



1. An integral ceramic component for a heating element to be strung together on a heating wire to form a flexible structure, characterized in that the ceramic component is of a type having an integral ceramic body defining two generally parallel passages therethrough for receiving the heating wire, both passages terminating at one end in a common slot between the two passages and indented from the end for receiving the heating wire without protruding from the end, one said passage terminating at the other end from the slot in a depression adapted to receive in mating overlapping registration thereinto a projection of a further like ceramic component, and the other said passage terminating at the other end from the slot in a projection adapted to extend in overlapping mating registration into the said depression of a further like ceramic component.

4,320,254
VOLUME CONTROL APPARATUS

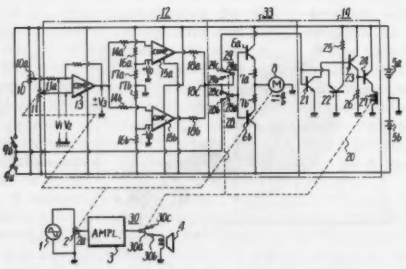
Kenzo Tottori; Yukio Akaba, and Shunichi Suganuma, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 7, 1980, Ser. No. 137,845

Claims priority, application Japan, Apr. 5, 1979, 54-41327; Apr. 12, 1979, 54-48817[U]

Int. Cl.³ H03G *3/00*

U.S. Cl. 179—1 VL **9 Claims**



1. A volume control apparatus comprising:

(a) a master-variable resistor for a volume control;

(b) a slave-variable resistor having first, second and third terminals, the resistance between the second and third terminals of which is varied in response to changes of the resistance of said master-variable resistor;

(c) a presettable-variable resistor having first, second and third terminals;

(d) a DC voltage source;

(e) coupling circuit means for supplying the DC voltage of said DC voltage source to the first and second terminals of said presettable-variable resistor, and said slave-variable resistor, respectively;

(f) first comparator means for comparing the voltages across the second and third terminals of said slave- and presettable-variable resistors and producing an output signal proportional to the voltage difference therebetween;

(g) second comparator means for comparing the output signal voltage from said first comparator means with a reference DC voltage and producing a control signal when the output signal voltage from said first comparator means is greater than said reference DC voltage; and

(h) control circuit means supplied with the control signal from said second comparator means and for controlling the resistance of said master-variable resistor and said slave-variable resistor.

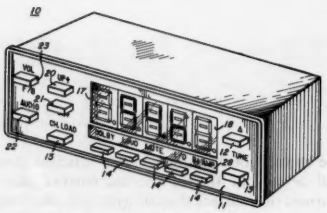
4,320,255
RADIO WITH AUDIO CONTROLS AND ASSOCIATED DISPLAYS

Michael W. Null, Schaumburg; Charles W. Bethards, Algonquin, and William A. Burzynski, Des Plaines, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 11, 1980, Ser. No. 158,531

Int. Cl.³ H04R *5/04*; H04S *7/00*; H04B *1/26*

U.S. Cl. 179—1 G **28 Claims**



1. An entertainment device comprising:

at least first and second speakers providing audio signals related to signals on an entertainment channel to which said entertainment device is tuned;

volume control means including up/down manual switch means, said volume control means, in a volume mode of operation of said entertainment device, operative in response to actuation of said up/down switch means for simultaneously step adjusting in the same direction the overall magnitude of all of the audio signals provided by each of said first and second speakers;

balance control means being operative in a balance mode of operation of said entertainment device for simultaneously step adjusting in opposite directions, in response to actuation of said up/down switch means, the overall magnitude of all of the audio signals provided said first speaker with respect to the overall magnitude of the audio signals provided said second speaker; and

manual selection means for selecting any one of said volume and balance modes for said entertainment device, whereby the same up/down switch means controls the related functions of volume and balance.

4,320,256
VERBALLY INTERACTIVE TELEPHONE INTERROGATION SYSTEM WITH SELECTIBLE VARIABLE DECISION TREE

Michael J. Freeman, 12 Maplewood Rd., Hartsdale, N.Y. 10530

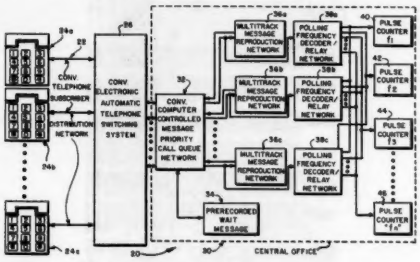
Filed Nov. 27, 1979, Ser. No. 97,687

Int. Cl.³ H04M *1/64*; H04Q *3/00*; G09B *7/04*

U.S. Cl. 179—6.04 **13 Claims**

1. In a verbally interactive telephone interrogation system comprising a two-way telephone subscriber network including

a telephone caller means and a telephone message routing means operatively connected to said telephone caller means for selectively connecting said telephone caller means to a remote message transmission means having an associated telephone number in response to provision of a unique dialing code from said telephone caller means corresponding to said associated telephone number; said telephone caller means comprising telephone reception means for receiving audio messages over said two-way telephone subscriber network; signal generator means for selectively transmitting a plurality of unique signal outputs over said two-way telephone subscriber network, and keyboard means operatively connected to said signal generator means for selecting the unique signal outputs to be transmitted over said two-way telephone subscriber network, said keyboard means comprising a plurality of selection keys each of which corresponds to a different associated signal output transmittable by said generator means in response to selection thereof; the improvement comprising signal discriminator and track selection means operatively connected to said telephone message routing means for enabling reception of said transmitted signal outputs from said telephone caller means when said telephone caller means is connected thereto via said telephone message routing means; and multitrack message reproduction means for selectively transmitting an audio message to said telephone caller means telephone reception means in response to selection by said telephone caller means keyboard means, said remote message transmission means comprising said multitrack message reproduction means, said multitrack message



reproduction means comprising a multitrack magnetic storage medium for providing a selectible reproducible conversational responsive audio message to a particular primary reproducible interrogatory message from a plurality of different selectible audio messages stored thereon and a multitrack audio playback means for selectively transmitting said audio messages from said storage medium to said selectively connected telephone reception means, said storage medium comprising a plurality of coextensive audio tracks having audio information stored thereon for audio playback therefrom, said signal discriminator and track selection means discriminating said received output signals transmitted from said caller means, each of said plurality of tracks having a unique associated track selection signal corresponding to one of said transmittable signal outputs, said selectively connected signal discriminator and track selection means selecting one of said plurality of audio tracks for playback by said playback means in response to reception and discrimination of the signal output corresponding thereto, said information being stored on each track in a plurality of reproducible information segments, each of said segments comprising a complete message reproducible directly in response to selective playback of said track upon which said segments are stored, at least one of said tracks stored information comprising primary interrogatory messages and associated multiple choice selectible derivative secondary interrogatory containing messages related in content to a particular primary interrogatory message, at least a plurality of said other tracks comprising derivative secondary interrogatory containing messages related in real time and content to said one track primary interrogatory messages and corresponding to said multiple choice selectible derivative secondary interrogatory containing messages, each of said plurality of other tracks comprising a different derivative secondary interrogatory containing message, said plurality of other tracks further comprising associated multiple choice selectible responsive messages related in real time and content to each of said plurality of derivative secondary interrogatory containing messages, only one of said plurality of other tracks comprising a unique selectible responsive message to a particular one of said real time related derivative secondary interrogatory messages, said derivative secondary interrogatory messages being chain linked in content to a particular primary interrogatory message for forming a caller selectible decision tree for ultimately directing said telephone caller to an ultimate branch on said selected decision tree, said stored primary and derivative secondary interrogatory messages and said associated responsive messages being spatially related to each other along said storage medium tracks in real time and further related in content to one another for providing a transitional derivative response to said primary interrogatory message dependent on the track selected and the real time of selection for providing a conversational real time transitional environment said primary interrogatory message comprising a plurality of multiple choice selectible different interrogatory messages each comprising a different category of question, each of said different categories of questions being associated with a different one of said plurality of other tracks, said secondary derivative categories messages corresponding to said different interrogatories of questions whereby a plurality of different interrogatories are simultaneously selectible, in a variable decision tree format, said associated responsive messages comprising a common set of responsive messages for each of said different selectible secondary derivative interrogatory messages, whereby said ultimate selectable decision tree branch is dependent upon the responses to said primary and secondary interrogatory messages comprising said selectable decision tree.

4,320,257

COMPENSATION OF TRANSMISSION LOSSES IN A TELEPHONE SYSTEM

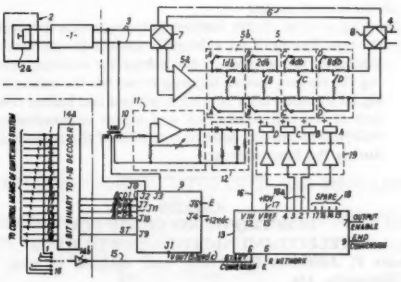
Bloomfield J. Warman, 67, King Harold's Way, Bexleyheath, Kent, DA7 5RE, England

Continuation-in-part of Ser. No. 895,562, Apr. 12, 1978, abandoned. This application Nov. 5, 1979, Ser. No. 91,687

Claims priority, application United Kingdom, Apr. 23, 1977, 15430/77

Int. Cl.³ H04M *1/76*; H04B *3/10*

U.S. Cl. 179—16 F **11 Claims**



5. Apparatus for providing transmission loss compensation at a predetermined location in a telephone transmission path comprising a multi-frequency tone receiver means of the kind adapted to respond to multi-frequency tone signals within the audible range capable of being transmitted via the telephone speech path from a calling to a called telephone station, in order to control switching functions in a telephone system, a

variable gain amplifying means provided in said transmission path, and signal level sensing means having an input connected to said transmission path and adapted to vary the gain of the said amplifying means in order to provide gain compensation dependent upon the level of a tone signal applied thereto, the said multi-frequency tone receiver means being arranged to provide an output signal to actuate said signal level sensing means upon receipt of a predetermined multi-frequency encoded tone signal.

4,320,258

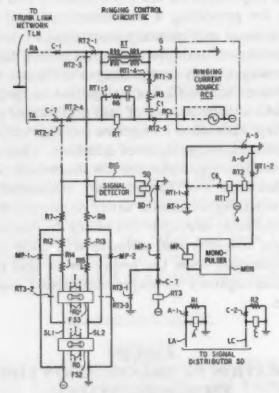
ARRANGEMENT FOR REQUESTING SERVICE FOR CALLED TELEPHONE SUBSCRIBERS

Henry S. McDonald, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 7, 1980, Ser. No. 166,750

Int. Cl.³ H04M *3/04, 3/42*

U.S. Cl. 179—18 B **7 Claims**



1. In a switching system which includes common control means for connecting a source of ringing signals to a called subscriber line and for completing a call connection to the subscriber line, a ring control circuit including means responsive to an answer by the subscriber for tripping the ringing source, the tripping means including means for manifesting the subscriber answer, and means operated by the common control means for scanning the answer manifestation to initiate completion of the call connection,

characterized in that

the ring control circuit further includes means for delaying the manifesting of the subscriber answer for an interval of time after the answer by the subscriber without precluding the ringing source tripping to permit the subscriber to signal a request after ringing is tripped and before completion of the call connection and means responsive to the delaying means for detecting receipt of the request signal during the time interval.

4,320,259

ELECTRONIC SELECTOR FOR TELECOMMUNICATIONS SWITCHING

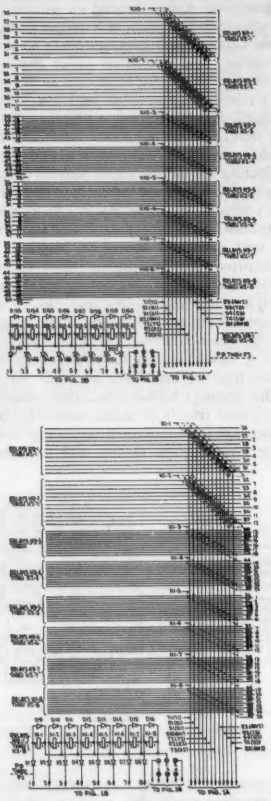
Roger F. Atkinson, Huntsville, Ala., assignor to Itec, Inc., Huntsville, Ala.

Filed Jul. 31, 1980, Ser. No. 174,137

Int. Cl.³ H04Q *3/28, 5/22*

U.S. Cl. 179—18 FG **17 Claims**

9. In a telephone switching system, at least one selector unit having a matrix of relays for sequentially energizing one relay at a time to connect plural telephone circuits to said selector in order that the circuits may be tested for an idle condition, said selector being characterized in that said matrix includes a plurality of twelve-pole relays for simultaneously connecting twelve wires to said selector, said twelve wires corresponding



to three four-wire circuits when said system operates in a four-wire mode and to four three-wire circuits when said system operates in a three-wire mode.

4,320,260

CIRCUIT ARRANGEMENT FOR DETERMINING THE CONNECTION CONDITION OF A SUBSCRIBER LINE IN A TELECOMMUNICATIONS NETWORK

Robert Lechner, Otterfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 9, 1980, Ser. No. 185,446

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1979, 2939009

Int. Cl.³ H04Q *3/00;* H04M *3/22*

U.S. Cl. 179—18 FA **12 Claims**

1. A circuit arrangement for determining the connections conditions of a plurality of subscriber lines in a telecommunications network, each of said subscriber lines having two wires extending between a subscriber station and a subscriber line interface circuit, said two wires being connected in said subscriber line interface circuit via respective resistors to the two poles of a DC voltage source, said circuit arrangement comprising in combination:

(a) first comparator means (K1) having first and second inputs and an output, said first comparator means produc-

ing a first output signal at its output indicating the presence of a first group of operating conditions;

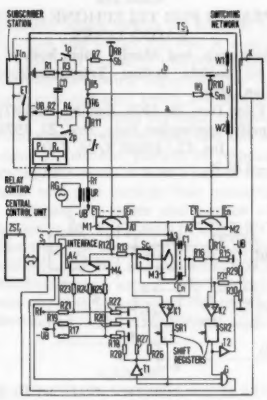
(b) second comparator means (K2) having first and second inputs and an output, said second comparator means producing a second output signal at its output indicating the presence of a second group of operating conditions;

(c) a first sampling point (Sb) in each subscriber line interface circuit presenting a first voltage condition thereof;

(d) a second sampling point (Sm) in each subscriber line interface circuit presenting a second voltage condition thereof;

(e) first selector means (M1) having parallel signal inputs, an output and a control input for receiving an address control signal for selectively connecting each one of said signal inputs to said output during a monitoring cycle, each of said signal inputs of said first selector means being coupled to a first sampling point of one of said subscriber line interface circuits;

(f) second selector means (M2) having parallel signal inputs, an output and a control input for receiving an address control signal for selectively connecting each one of said signal inputs to said signal output during a monitoring cycle, each of said signal inputs being coupled to a second



sampling point of one of said subscriber line interface circuits, at least one input of each of said first and second comparator means being coupled to said first and said second sampling points via said first and second selector means and a respective voltage divider;

(g) central control means (ZST and S) for selecting certain operating conditions of each subscriber line interface circuit;

(h) first reference voltage source means, responsive to said central control means, for producing a first reference voltage in accordance with the selected operating condition of the monitored subscriber line interface circuit, said first reference voltage being coupled to one of said inputs of said first comparator means;

(i) a plurality of filter capacitors (Cl to Cn);

(j) means coupling a separate one of said capacitors across said inputs of said first comparator means for every selection position of said first and second selector means; and

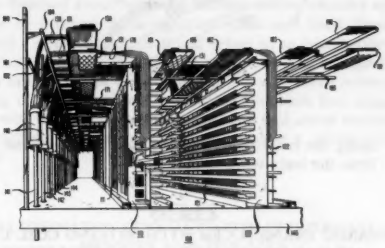
(k) signal enabling means, coupled to the outputs of said first and second comparator means, for passing said second output signal in dependence upon the state of said first output signal and the selected operating condition of the monitored subscriber line interface circuit.

4,320,261

CABLE ROUTING METHODS AND APPARATUS

Louis J. Scerbo, Succasunna, and Jeremia P. Starace, Randolph Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 3, 1980, Ser. No. 193,448
Int. Cl.[3] H04Q *1/06*
U.S. Cl. 179—98 5 Claims



1. A method for connecting a distributing frame system (100) with incoming cables (130, 131 or 230,231), said system comprising at least one row of contiguous frame modules having alternating appearances of outside plant terminals (113) and central office equipment leads (114) connected by jumpers on the equipment side (112) of said modules and a racking arrangement having in-line (150, 160–163, or 190,191) and lateral (170, 171 or 192–195) members wherein a plurality of said members with one orientation and said members having the other orientation are utilized in seriatim to route said cables to said modules, said method

characterized by the steps of assigning each of said cables to a particular one of said modules according to a predetermined pattern to minimize the lengths of said jumpers,

partitioning said cables into groupings in correspondence to the number of said members in said plurality according to a preselected pattern to minimize cable cross-overs during routing,

vertically displacing a first plane containing said members with said one orientation from a second plane containing said members with said other orientation, and

distributing said cables in accordance with assigned and partitioned location by routing the individual cables in said groupings along said members in said second plane to corresponding members in said first plane.

4,320,262

TELEPHONE HANDSET WITH INTEGRAL SHOULDER REST

Clifford D. Read, Almonte, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 20, 1980, Ser. No. 123,259
Int. Cl.[3] H04M *1/02*
U.S. Cl. 179—103 9 Claims

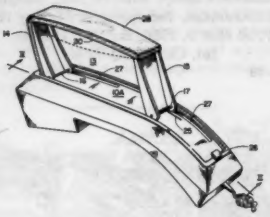
1. A telephone handset comprising a body housing a transmitter and a receiver;

characterized by:

an integral shoulder rest having a pair of arms each hinged at one end to the body;

each of the pair of arms is hinged at its other end to a shoulder plate;

The arms, the plate and at least a portion of the body of the handset forming a foldable parallelogram unit so as to lie



along the body when folded down and to extend away from the body when opened up.

4,320,263

DYNAMIC TRANSDUCER WITH MOVING COIL IN AN AIR GAP FILLED WITH MAGNETIC LIQUID

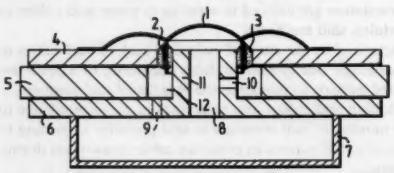
Karl-Heinz Thiele, Peine-Stederdorf, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Fed. Rep. of Germany

Filed Jan. 2, 1980, Ser. No. 109,184

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1979, 2900427

Int. Cl.³ H04R *9/02*

U.S. Cl. 179—115.5 VC **5 Claims**



1. An electroacoustic transducer comprising, a magnetic pole case defining an air gap, a coil movably mounted in the air gap and spaced from the magnetic pole case, magnetic liquid extending between the coil and the case in the air gap, and a diaphragm connected to the coil and to the case defining with the case a sealed space above and below the magnetic liquid which is gastight, the diaphragm and case defining the sealed spaces being made of material having a pore size substantially less than a mean free path of molecules of magnetic liquid evaporated from the magnetic liquid in said air gap.

4,320,264

LOUDSPEAKER WITH A HEAT RESISTANT TWO-PART DIAPHRAGM

Michel Visan, and Lydia Isfan, both of Vincennes, France, assignors to Siare-Societe Industrielle d'Applications/Radio-Electriques, Saint-Maur-des-Fosses, France

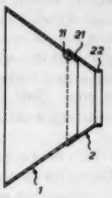
Filed Jun. 5, 1980, Ser. No. 156,628

Claims priority, application France, Nov. 28, 1979, 79 29232

Int. Cl.³ H04R *9/04, 9/06*

U.S. Cl. 179—115.5 R **15 Claims**

1. A loudspeaker of the type comprising a vibrating generally frustoconical composite diaphragm actuatable by a moving electrically energized heat-generating coil carried on a support, said generally frustoconical composite diaphragm comprising two parts of different materials including a first outer part of synthetic polymeric or copolymeric material of relatively low heat resistance and a second inner part extending from said first part to the support for the moving coil, said second inner part being made of a material having a heat resistance greater than that of the synthetic material of said first



part whereby the coil generated heat can not adversely affect said first part.

4,320,265

LINE REPEATER FOR TELEPHONE SYSTEM USING RADIO LINKS

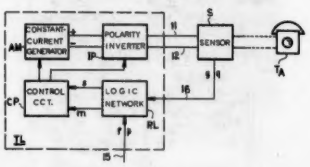
Giancarlo Biggiogera, and Manlio Saba, both of Milan, Italy, assignors to Societa Italina Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Dec. 21, 1979, Ser. No. 105,871

Claims priority, application Italy, Dec. 22, 1978, 31258 A/78

Int. Cl.³ H04B *3/36, 7/00*

U.S. Cl. 179—170 R **11 Claims**



1. In a telecommunication system wherein an exchange communicates with a plurality of local stations via respective radio links extending between a central terminal and a plurality of transceivers coupled by way of respective repeaters and line loops with said local stations, the latter having equipment operable by activating signals from said exchange,

the improvement wherein each of said repeaters comprises:

a constant-current generator provided with polarity-inverting means connected across a pair of conductors coupled to the associated line loop;

sensing means connected to said line loop for detecting the operational state of the associated local station and emitting a response signal upon ascertaining a predetermined change in said operational state;

logic circuitry with a first input connection from the associated transceiver and with a second input connection from said sensing means for emitting a switching signal under the control of an activating signal originating at said exchange and terminating said switching signal under the control of a response signal initiated by the associated local station; and

control means responsive to said switching signal inserted between said logic circuitry and said polarity-inverting means for reversing the current flow in said conductors to generate at least one binary pulse at said local station.

4,320,266
SWITCH FOR COMBINED HEATER PLUG OR IGNITION AND STARTING CIRCUITS IN A MOTOR VEHICLE

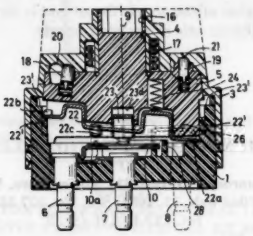
Heinz Leiter, Gemmrigheim, and Rudi Plog, Bietigheim-Bissingen, both of Fed. Rep. of Germany, assignors to Merit-Werk Merten & Co. KG, Gummersbach, Fed. Rep. of Germany

Filed Dec. 12, 1979, Ser. No. 102,950

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853681

Int. Cl.³ H01H *9/00*

U.S. Cl. 200—4 **14 Claims**



1. A multiposition rotary switch for separate load circuits, particularly ignition and starter circuits in a motor vehicle, comprising at least two mutually insulated conductive arms crossing each other and being supported for joint rotation about a common axis and each being movable in axial direction, said arms defining two end portions, respectively; a plurality of load contacts arranged around said axis in the path of rotary movement of one end portion of respective arms to engage periodically the same; at least a pair of stationary cams arranged around said axis outside load contacts, said cams continuously engaging the other end portion of respective arms to lift and lower adjoining parts of said arms during their rotation; contact elements formed on the axially movable parts of said arms between said axis and said other end portions; and stationary counter-contact means concentrically arranged around said axis opposite said contact elements to engage the latter at predetermined angular positions of said arms.

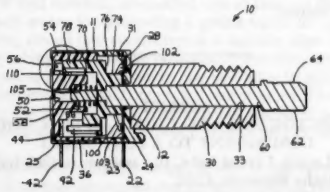
4,320,267
MULTIPLE-FUNCTION SWITCH WITH AUTOMATIC RETURN

James E. Greve, South Bend, Ind., and John Zdanys, Jr., Edwardsburg, Mich., assignors to CTS Corporation, Elkhart, Ind.

Filed Jun. 30, 1980, Ser. No. 164,781

Int. Cl.³ H01H *9/00, 21/76*

U.S. Cl. 200—4 **13 Claims**



1. A multiple-function switch with positive rotational locking to effectively prevent rotational displacement upon axial displacement, comprising a housing having a plurality of housing terminals and a collector therein, said housing terminals extending from said housing, a driver having a resilient contactor, contacts secured to said driver, and a projection means, a shaft having said driver mounted thereon for rotation therewith, a cover having cover terminals disposed within an opening in said cover and extending from the cover and said cover have a receiving means, axially disposed resilient means for axially biasing said driver, and resilient means disposed about said axial resilient means and contained entirely within said housing whereby rotation of said shaft effects wiping engagement between said contactor, collector, and selected housing terminals and biases said projection means against said resilient means disposed about said axial resilient means whereby upon release of external rotation forces upon said shaft there is effected a return of said shaft and driver to an initial position, axial movement of said shaft displacing axially said projection means into said receiving means to effect a positive rotational locking of said driver and moving said contacts into engagement with said cover terminals whereby said cover terminals are electrically interconnected to complete a circuit thereacross.

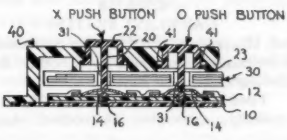
4,320,268
ILLUMINATED KEYBOARD FOR ELECTRONIC DEVICES AND THE LIKE

Robert E. Brown, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Feb. 19, 1980, Ser. No. 123,105

Int. Cl.³ H01H *13/70*

U.S. Cl. 200—5 A **7 Claims**



1. An improved keyboard for electrical devices and the like comprising:

a. a switch having a first movable contact mechanically urged in a first direction, said first contact having means to be engaged for movement in a second direction opposite said first direction to engage a second contact and close said switch;

b. an electroluminescent panel positioned adjacent said switch in the vicinity of said means to be engaged;

c. and a push button positioned adjacent said electroluminescent panel on the side thereof away from said switch, said push button being formed of a relativey transparent material and having an actuator that extends from said push button through an opening in said electroluminescent panel for engaging said contact means to be engaged, whereby depression of said push button causes said first movable contact to move in said second direction and close said switch.

4,320,269
VACUUM INTERRUPTER WITH INCREASED SEPARATION OF FUNCTIONS

Joseph A. Rich, Schenectady, and James J. Carroll, Clifton Park, both of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

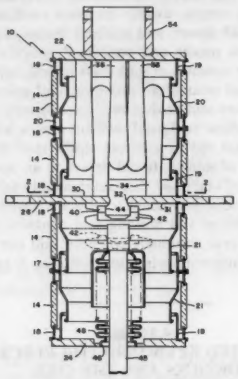
Filed Jul. 25, 1979, Ser. No. 60,586

Int. Cl.³ H01N *33/66*

U.S. Cl. 200—144 B **18 Claims**

1. A vacuum device comprising: an evacuated enclosure having a plurality of chambers therein, a plurality of rod shaped arc surfaces in a first said chamber, a pair of separable contacts in a second said chamber adjacent said first chamber, and means defining a communicating opening between said first and second chambers, said rod shaped arc surfaces and

said separable contacts being connected in a common circuit wherein arcing products from arcing between said separable

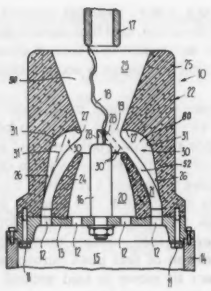


contacts will be conveyed to said first chamber through said communicating opening and will initiate arcing between said rod shaped arc surfaces.

4,320,270
GAS-BLAST SWITCH

Rudolf Graf, Obermuhen, and Christian Sturzenegger, Zurich, both of Switzerland, assignors to Sprecher & Schuh AG, Aarau, Switzerland

Filed Feb. 11, 1980, Ser. No. 120,391
Claims priority, application Switzerland, Apr. 12, 1979, 3511/79
Int. Cl.³ H01H *33/88*
U.S. Cl. 200—148 A **8 Claims**

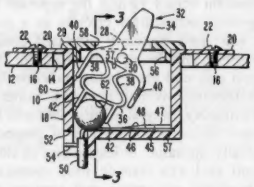


1. A gas blast switch, comprising:
a movable contact element;
a stationary contact element cooperating with the movable contact element;
a blast nozzle operatively associated with one of the contact elements;
said blast nozzle having a nozzle chamber comprising a converging inlet portion, a throat and a diverging outlet portion;
means defining a pump chamber for an extinguishing gas which can be pressurized during the course of a cut-off stroke of the gas-blast switch;
said inlet portion of said blast nozzle being connected with said pump chamber;
said blast nozzle surrounding the related contact element;
channel means formed in said blast nozzle and flow communicating with the pump chamber;
said channel means opening at an angle with respect to the lengthwise axis of the blast nozzle into the nozzle chamber;
said channel means comprising inwardly open grooves starting at the region of the converging inlet portion;
each of said grooves having a bottom;
each groove bottom having a starting portion arranged upstream of the flow direction of the extinguishing gas and extending in the inlet portion essentially parallel to the flow direction of the extinguishing gas; and
each groove bottom having an end section which is arranged in the region of the nozzle throat and is directed towards the lengthwise axis of the blast nozzle.

4,320,271
AC SWITCH MECHANISM OF THE BALL CONTACT TYPE

Ronald G. Munroe, P.O. Box 317, Georgetown, S.C. 29440

Filed Feb. 23, 1981, Ser. No. 237,337
Int. Cl.³ H01H *13/28*
U.S. Cl. 200—277 **22 Claims**



1. A switch comprising:
(a) a housing of electrically insulative material having a contact support wall;
(b) stationary electrical contact means supported upon and extending along said wall;
(c) contact-supporting rib means on said wall having ramps inclined at a slight angle in respect to said stationary contact means;
(d) a ball contact movable along said wall from a first, "on" position in which it engages the stationary contact means and a second, "off" position in which it leaves the stationary contact means via said ramps and comes to rest upon the rail means in spaced relation to the stationary contact means; and
(e) actuator means movably mounted in the housing for biasing the ball contact between the "on" and "off" positions thereof.

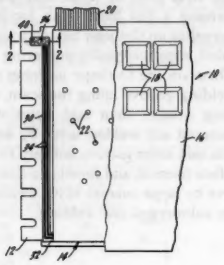
4,320,272
CONNECTOR FOR ATTACHING AN ELECTRICAL COMPONENT TO A FLAT SHEET

Willis A. Larson, Crystal Lake, Ill., assignor to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Jan. 26, 1981, Ser. No. 228,319
Int. Cl.³ H01H *9/02*
U.S. Cl. 200—317 **9 Claims**

1. In a membrane switch keyboard of the type having a membrane layer, a substrate layer and a spacer between them, the improvement comprising means for connecting a discrete electrical component to the keyboard, including a tail extending from one of said layers and having a free end secured to the

keyboard, conductive traces formed on the tail and extending into contact with the leads of an electrical component, the



component being disposed between the tail and the keyboard so that the tail holds the component in place.

4,320,273
APPARATUS FOR HEATING AN ELECTRICALLY CONDUCTIVE COOKING UTENSIL BY MAGNETIC INDUCTION

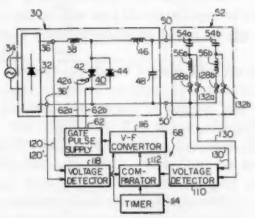
Mitsuyuki Kiuchi, Kadoma, Japan, assignor to Matsushita Electric Industrial Company, Limited, Japan

Continuation of Ser. No. 783,702, Apr. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 577,156, May 14, 1975, abandoned. This application Jan. 22, 1979, Ser. No. 5,574

Claims priority, application Japan, May 17, 1974, 49-55890; May 17, 1974, 49-55891; May 17, 1974, 49-55893

Int. Cl.³ H05B *6/06, 6/12*

U.S. Cl. 219—10.49 R **1 Claim**



1. An induction heating cooking apparatus having a plurality of induction heating coils, means for manually selectively connecting one or more of said heating coils in one of parallel and series circuit relationships with a single inverter circuit including a switching circuit and a commutating circuit part of which is said manually connected one or more of said heating coils, and means for generating a gating signal for gating said switching circuit into conduction at a variable high frequency, said switching circuit being powered by low frequency energy when said apparatus is brought into operation to generate high frequency energy in said connected one or more of said heating coils by the action of said commutating circuit in response to said gating signal, and a feedback control circuit which comprises:

means for detecting the output power of said inverter delivered to said connected one or more heating coils;

means for detecting the input power of said inverter;

means for detecting the difference between said detected input and output power and varying the frequency of said gating signal as a function of said detected difference so that the amount of power delivered to said connected one or more of said heating coils is maintained constant, thereby effecting in said feedback control circuit a tendency to cause the frequency of said high frequency energy to reduce to a level below an inaudible frequency limit at the instant said inverter is brought into operation; and

means effective for a predetermined interval in response to said inverter being brought into operation for causing the frequency of said high frequency energy to increase to a level above said inaudible frequency limit.

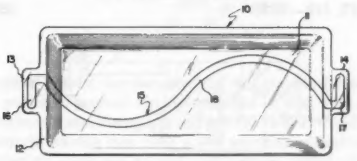
4,320,274
COOKING UTENSIL FOR UNIFORM HEATING IN MICROWAVE OVEN

Rudolph A. Dehn, Schenectady, N.Y., assignor to RTE Corporation, Waukesha, Wis.

Filed Jan. 14, 1980, Ser. No. 111,550

Int. Cl.³ H05B *6/64*

U.S. Cl. 219—10.55 E **7 Claims**



1. Cookware for use in a microwave oven that has an oven cavity in which there are electromagnetic fields for heating a food load comprising:

a dielectric utensil having a bottom wall;

a patterned metal layer applied to said utensil which is continuous and includes at least one pickup probe and a bottom wall conductor pattern;

said pickup probe serving to couple microwave energy from the oven cavity electromagnetic fields to said bottom wall conductor pattern and realize more uniform heating of the food load in said utensil.

4,320,275
MICROWAVE OVEN WITH RESISTANCE HEATING UNIT

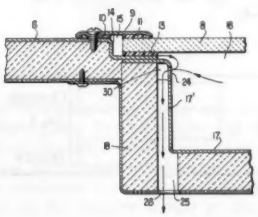
Willi Reiss, Nuremburg, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 19, 1980, Ser. No. 208,333

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1979, 2946766

Int. Cl.³ H05B *6/70*

U.S. Cl. 219—10.55 B **12 Claims**



1. In an oven including walls defining a cooking chamber; means defining a microwave window in one of said walls; a glass-ceramic plate covering said window; a microwave connecting housing adjoining said window externally of said cooking chamber and defining a space bounded by parts of said sealing means; microwave generating and guiding means bounding at least in part the space defined by said connecting housing for directing microwave energy into said cooking

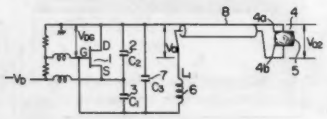
chamber through said connecting housing and said window; and electric resistance heating means operatively connected with said cooking chamber; the improvement comprising sealing means extending along peripheral portions of said plate; means defining air inlet openings communicating with the space defined by said connecting housing and means for introducing pressurized air into said space for generating therein an air pressure affecting said parts of said sealing means.

4,320,276

DIELECTRIC HEATING DEVICE

Takashi Takeuchi, Fujisawa; Yoichi Kaneko, Tokorozawa, and Hisato Owatari, Kyoto, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1980, Ser. No. 115,409
Claims priority, application Japan, Jan. 26, 1979, 54-7139
Int. Cl.³ H05B *9/04*
U.S. Cl. 219—10.81 **15 Claims**



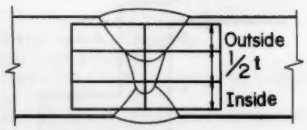
1. A dielectric heating device comprising:
a series circuit made up of a capacitor and a coil, said capacitor having a pair of electrodes between which frozen goods to be subjected to dielectric heating may be disposed, the capacitance of said capacitor varying in response to the heating of said frozen goods;
an amplifier having an input and an output, said series circuit being connected across said output of said amplifier; and
positive feedback means for establishing a positive feedback of a part of the output voltage appearing at said output of said amplifier to said input thereof to allow said amplifier to oscillate, the oscillation frequency of said amplifier depending upon the resonance frequency of said series circuit.

4,320,277

THICK WELDED STEEL PIPE OF LARGE DIAMETER AND PRODUCTION THEREOF

Tadaaki Taira; Kiyoteru Hirabayashi; Hiroyuki Ichinose; Osamu Hirano, all of Fukuyama, and Motoaki Suzuki, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1980, Ser. No. 124,559
Claims priority, application Japan, Feb. 23, 1979, 54-19644
Int. Cl.³ B23K *31/06, 9/18*
U.S. Cl. 219—61 **5 Claims**



1. A method of producing thick steel pipe of large diameter comprising successively forming a flat blankwork having edges into a U-shape and thereafter into an O-shape having a single longitudinal seam to be welded; asymmetrically preparing the edges of the blankwork to form on the O-shape an inner welding groove and an outer welding groove along the seam, said inner welding groove being smaller than said outer welding groove; forming a submerged arc welded layer by an AC multi-pole SAW machine in said inner groove entirely from an innermost portion to a surface thereof; and forming a first welded layer in said outer groove by large current MIG welding and a second layer by submerged arc welding.

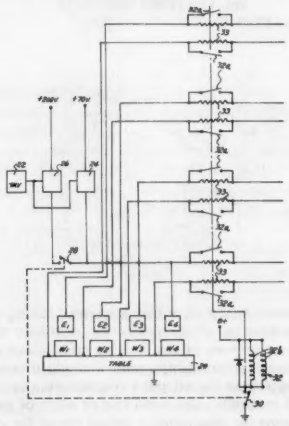
5. Thick wall steel pipe of large diameter produced by: successively forming a flat blankwork having edges into a U-shape and thereafter an O-shape having a single longitudinal seam to be welded, asymmetrically preparing the edges of the blankwork to form on the O-shape an inner welding groove and an outer welding groove along the seam, said inner welding groove being smaller than said outer welding groove, forming a submerged arc welded layer by an AC multi-pole SAW machine in said inner groove entirely from an innermost portion to a surface thereof, and forming a first welded layer in said outer groove by large current MIG welding and a second welded layer by submerged arc welding.

4,320,278

SERVO FEED SYSTEM FOR ELECTRICAL DISCHARGE MACHINING APPARATUS

Oliver A. Bell, Jr., Statesville; Randall C. Gilleland, Troutman, and Davey J. Chance, Concord, all of N.C., assignors to Colt Industries Operating Corp, New York, N.Y.

Filed Mar. 26, 1979, Ser. No. 23,634
Int. Cl.³ B23P *1/02*
U.S. Cl. 219—69 G **8 Claims**



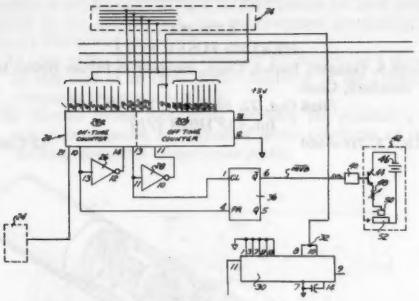
1. In an electrical discharge machining circuit with a workpiece and a relatively movable electrode and having the capability of both high voltage level machining power pulses and low voltage level machining power pulses, a switching means for changing operation between such high and low voltage levels, a servo feed system including a gap voltage sensing lead connected to the gap; a reference voltage source; an electrically energized element coupled to said lead and to said reference voltage source; a motive means, said electrically energized element operable to control the operation of said motive means and thus the movement of the electrode responsive to the difference between said gap and reference voltages; and a second switching means conjointly operable with said first switching means for switching said resistor into operable position in said sensing lead responsive to changeover from low to high voltage level operation.

4,320,279

PROGRAMMABLE PULSE GENERATOR FOR ELECTRICAL DISCHARGE MACHINING APPARATUS

Oliver A. Bell, Jr., Statesville; Randall C. Gilleland, Troutman, and Davey J. Chance, Concord, all of N.C., assignors to Colt Industries Operating Corp, New York, N.Y.

Filed Aug. 21, 1979, Ser. No. 68,328
Int. Cl.³ B23P 1/02
U.S. Cl. 219—69 P 4 Claims



1. A pulse generator for an electrical discharge machining apparatus including a power module associated with the machining gap for providing machining power pulses thereto, comprising:

a programmable interval timer/counter having two counter sections, each having its respective gate input, one controlling machining power pulse on-time and the other controlling machining power pulse off-time;

an inverter connected between the output of the first section and the gate input of the second counter section;

a second like poled inverter connected between the output of the second section and the gate input of the first section, both of said counter sections being of the count to zero type; and

a flip-flop having a pair of inputs and further having an on-time and off-time output, the output of said first counter section connected to one of the inputs of said flip-flop, the output of the other counter section connected to the other input of the flip-flop, the two outputs of the flip-flop operably connected to and controlling machining power pulses passed to said power module, said two counter sections each operable to receive a new data input from a microprocessor and thus render it effective following the operation of the other counter sections without interrupting the operation of the pulse generator.

4,320,280

TRAVELING-WIRE EDM METHOD

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

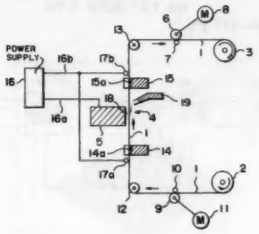
Filed Mar. 4, 1980, Ser. No. 127,066
Claims priority, application Japan, Mar. 30, 1979, 54/37929; Apr. 24, 1979, 54/51265
Int. Cl.³ B23P 1/02
U.S. Cl. 219—69 W 11 Claims

1. An EDM method of machining a workpiece, comprising the steps of:

axially advancing a continuous wire electrode with an original radius from a supply side to a take-up side to continuously transport said wire electrode through a machining zone of a workpiece between a first wire support member at the upstream side and a second wire support member at the downstream side;

supplying a machining liquid to said machining zone;

passing a succession of electrical machining current pulses between the wire electrode and the workpiece in the machining zone flushed with said machining liquid to electroerosively remove material from the workpiece and simultaneously producing with said pulses successively on said wire electrode during passage through the machining zone, electrical discharge craters thereby forming raised formations on said wire electrode leaving said machining zone and guided by said second support member; and



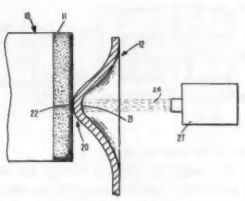
controlling at least one parameter of said electrical machining pulses to control the deformation of said wire electrode in said machining zone so that the radius of said wire electrode leaving said zone at the portions of said raised formations does not exceed said original radius of said wire electrode advanced into said machining zone.

4,320,281

LASER BONDING TECHNIQUE AND ARTICLE FORMED THEREBY

David G. Cruickshank, Hopewell Township, Mercer County, and Robert Webb, Ewing Township, Mercer County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jul. 31, 1980, Ser. No. 174,052
Int. Cl.³ B23K 27/00
U.S. Cl. 219—121 LD 6 Claims



1. A method of bonding a first article to a second article at respective bonding sites thereof, at least one of the articles having previously deposited reflowable bonding material at its bonding site, the method comprising:

forming an indentation in the first article which results in a protrusion in the opposite surface of the article at its bonding site;

placing the protrusion of the indented first article in contact with the second article at its bonding site;

directing a beam of radiant energy into the indented portion of the first article to heat said portion and reflow the bonding material previously deposited on at least one of the bonding sites; and

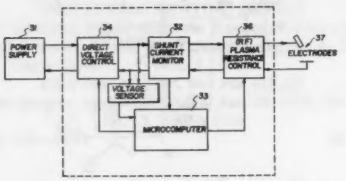
removing the beam to permit the reflowed material to solidify to form the bond between the first and second articles.

4,320,282

MICROPROCESSOR BASED ARC-AIR AND WELDER NOISE ABATEMENT CONTROLLER

John F. McDonald, Clifton Park; Henry A. Scarton, Troy, both of N.Y.; Warren C. Kennedy, Pittsburgh, Pa., and Paul B. Crilly, Ft. Collins, Colo., assignors to Rensselaer Polytechnic Institute, Troy, N.Y.

Filed Feb. 15, 1980, Ser. No. 121,887
Int. Cl.³ B23K *9/06*
U.S. Cl. 219—137 PS **15 Claims**



10. A method of reducing impulse noise to a sudden short period diminution in electric arc current which accompanies extinction of an arc, the method comprising the steps of:

detecting change in power parameters applied to produce an arc which are indicative of a pending arc extinction;

comparing such change with a specific recorded change values of such parameters known to be capable of producing an impulse noise and indicative of a pending arc extinction; and

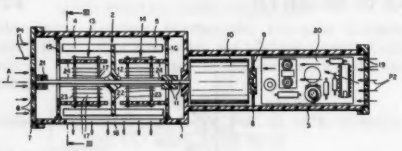
increasing arc-sustaining parameters if the comparison establishes that the detected change is at a greater rate than the specific recorded change.

4,320,283

BLOW DRYER WITH HEATER INSIDE STAND

Gottfried Voigt, Frankfurt am Main, Fed. Rep. of Germany, assignor to Braun AG, Kronberg, Fed. Rep. of Germany

Filed Dec. 6, 1978, Ser. No. 966,952
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1977, 2755698
Int. Cl.³ H05B *1/00*; **F24H** *3/04*; **A45D** *20/10*
U.S. Cl. 219—369 **5 Claims**



1. A blow dryer comprising:

a hollow housing extending along an axis, said housing having a slender handle centered on said axis and adapted to fit in a hand, said housing having a large head centered on said axis and carried on said handle, said housing being formed at said head and at said handle with respective axially opening inlets and at said head with a radially opening outlet;

a centrifugal fan centered on and rotatable about said axis in said head and having at said axis a hollow interior, said fan having a central hub at said axis and a plurality of blades secured to said hub offset from said axis and each having one portion extending axially in one direction from said hub and another portion extending axially in the opposite direction from said hub;

drive means in said housing including a motor in said handle for rotating said fan and thereby conducting air in two paths from said inlets to said outlet, one path passing through said handle and over the respective portion of said blades through said interior of said fan, the other path passing from the respective inlet to said interior of said fan, said paths exiting together from said head at said outlet; and

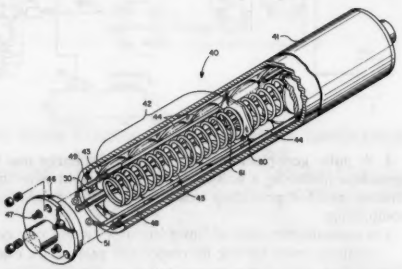
a heater centered on said axis in said interior, said heater having a pair of basket-type heater elements axially flanking said hub and lying in the respective paths, whereby the air of each path enters said housing via the respective inlet, passes over the respective heater element, and is displaced by the respective blade portion.

4,320,284

HEATED FUSER ROLL

Hugh S. Dannatt, Bethel, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 22, 1980, Ser. No. 199,175
Int. Cl.³ H05B *3/10*
U.S. Cl. 219—469 **13 Claims**



1. A heated fuser roll for use in a fuser apparatus for fixing toner images to a support surface, said fuser roll comprising:

a. a circular sleeve member;

b. a plurality of heating units positioned within said sleeve member, each unit including (i) a plurality of axially disposed thermally conductive members each formed of a chordal section having a curved surface positioned in contiguous relation to the inside curved surface of said sleeve member and a substantially flat surface, the chordal sections being set apart within said sleeve at about 120° one to another, (ii) a plurality of wafer shaped heating elements formed of a semiconducting ceramic material having a positive temperature coefficient of resistivity and exhibiting a Curie temperature transition point at which the resistance of said material increases with increasing temperature, said elements being positioned in contiguous relation to one another along said flat surface of each of said conductive members, and (iii) resilient means in the form of an open coil spring extending axially within said sleeve member positioned in contiguous relation to said heating elements for exerting a substantially continuous pressure on said heating elements to keep said elements in contact with said conductive members and to provide a plurality of independent multiple electrical contacts with said elements; and

c. each heating unit being separated from the adjacent heating unit by an insulating member, said spring of each unit extending to abut the insulating member.

4,320,285

PRIMARY THERMOSTAT USING COOKING COMPUTER TEMPERATURE PROBE WITH CONTROL TRANSFER UPON PROBE FAILURE

Bernard G. Koether, 4 Nutmeg La., Westport, Conn. 06880

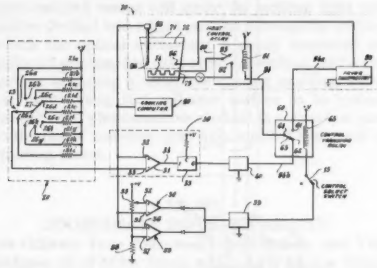
Filed May 10, 1979, Ser. No. 37,849
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—497 **8 Claims**

1. An improvement in a fryer of the type comprising a frypot for holding cooking oil, heating means for heating the cooking

oil in the frypot, heat control switching means for operating the heating means, the heat control switching means operated by a fryer thermostat including a temperature probe for sensing the actual temperature of the cooking oil and means for selecting a desired temperature of the cooking oil, the heating means being operated by a signal from the fryer thermostat when the actual temperature of the cooking oil falls below the desired temperature thereof, the fryer also being provided with a cooking computer and an associated cooking computer temperature probe for calculating a cooking period for food items cooked in the cooking oil, the improvement comprising a primary thermostat including:

(A) open probe monitoring circuitry for producing a signal in response to an open probe condition of the cooking computer temperature probe;

(B) shorted probe monitoring circuitry for producing a signal in response to a shorted probe condition of the cooking computer temperature probe;



(C) control transfer switching means placing control of the heat control switching means in the primary thermostat when the cooking computer temperature probe is not open and not shorted and automatically switching control of the heat control switching means to the fryer thermostat if the cooking computer temperature probe becomes open or shorted;

(D) temperature select means for producing a signal corresponding to a selected desired temperature of the cooking oil; and

(E) temperature control circuitry for comparing the signal of the cooking computer temperature probe corresponding to the actual temperature of the cooking oil with the signal produced by the temperature select means corresponding to the desired temperature of the cooking oil, the temperature control circuitry producing a signal operating the heat control switch means when the actual temperature of the cooking oil is below the desired temperature of the cooking oil and control of the heat control switching means is in the primary thermostat.

4,320,286

HEATER ELEMENT

Ronald J. Borrup, South Pasadena, Calif., assignor to Sierracin Corporation, Sylmar, Calif.

Filed Dec. 7, 1979, Ser. No. 101,215

Int. Cl.[3] **H05B** *3/34*

U.S. Cl. 219—549 **24 Claims**

1. A heater element which comprises:

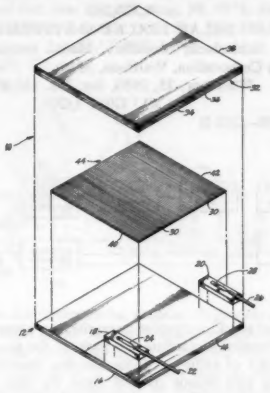
(a) a first layer comprising an elastomeric dielectric;

(b) a length of electrically conductive heater filament of a predetermined resistivity having a first end and a second end disposed on such a first layer;

(c) a first electrical lead placed on the first layer so that one end of said first electrical lead touches the first end of the electrically conductive heater filament for forming a first electrical contact and the other end of said first electrical lead protrudes beyond the first layer;

(d) a second electrical lead placed on the first layer so that one end of said second electrical lead touches the second end of the electrically conductive heater filament for forming a second electrical contact and the other end of said second electrical lead protrudes beyond the first layer;

(e) a second layer comprising an elastomeric dielectric dis-



posed over the heater filament and the first and second electrical contacts; and

(f) means for permanently connecting the first layer to the second layer so that the first and second electrical contacts are enclosed between said first and second layers and are permanently maintained solely by forces exerted by such elastomeric dielectric.

4,320,287

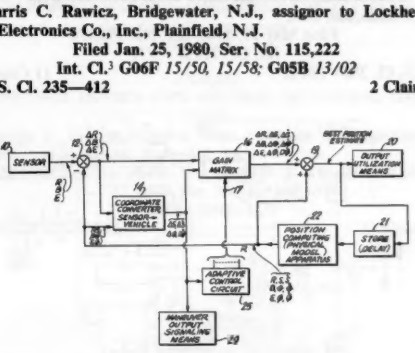
TARGET VEHICLE TRACKING APPARATUS

Harris C. Rawicz, Bridgewater, N.J., assignor to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Jan. 25, 1980, Ser. No. 115,222

Int. Cl.[3] **G06F** *15/50, 15/58;* **G05B** *13/02*

U.S. Cl. 235—412 **2 Claims**



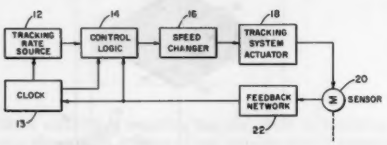
1. In combination in apparatus for filtering the velocity of a target vehicle, said apparatus utilizing both sensor coordinates and target reference coordinates, an output for supplying signals representing the best target estimate, difference means including first and second subtractive inputs and an output, target position predicting computing means connecting said output and said first input of said difference means, sensor means measuring present target information connected to the second input of said difference means, said difference means generating a positional error for the target in sensor coordinates, summing means responsive to outputs of said target position predicting computing means, coordinate converting means having an output, a first input connected to said target predicting computing means and a second input connected to

said output of said difference means for generating at said output of said coordinate converting means error signals measured in said target reference coordinates, and gain matrix means having inputs connected to outputs of said difference means and said coordinate converting means and an output connected to said summing means.

4,320,288
SOLAR TRACKING SYSTEM

Ronald S. Schlarlack, Brookline, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Apr. 25, 1980, Ser. No. 143,403
Int. Cl.³ G01J *1/20*
U.S. Cl. 250—203 R **10 Claims**

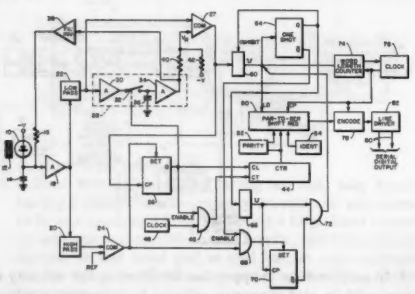


1. A solar tracking system comprising a source of precalculated information regarding the path of the sun on any given day, a sensor of radiation from the sun, means for normally maintaining said sensor trained upon the sun in accordance with signals derived from said source of precalculated information, and means providing an output from said sensor for modifying said signals to reorient said sensor only upon detection by said sensor of radiation above a predetermined threshold level and failure of said sensor to remain trained upon the sun within a predetermined degree of error.

4,320,289
PRECISION LASER PULSE RADIOMETER

Jack R. White, Camarillo; Charles L. Godwin, and Raymond J. Blattel, both of Oxnard, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 27, 1980, Ser. No. 153,474
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—214 R **11 Claims**



1. Apparatus for detecting and measuring radiant energy from a pulsed laser in the presence of ambient light, which comprises:

a. means responsive to pulses of radiant energy incident thereon for producing a current proportional to the instantaneous radiant energy of said incident pulses;

b. means for integrating the current produced by said means responsive to said pulses to produce a voltage signal proportional to the total radiant energy of said incident pulse;

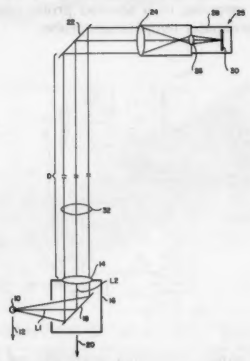
c. means for discharging said voltage signal at a preselected time constant; and

d. means for measuring the period of time that the voltage signal produced by said integrating means in response to the current produced by said pulse is greater than a reference voltage, the period of time being proportional to the logarithm of the total pulse energy.

4,320,290
CONSTANT MAGNIFICATION OPTICAL TRACKING SYSTEM

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Robert E. Frazer, LaCanada, Calif.

Filed Apr. 30, 1980, Ser. No. 145,282
Int. Cl.³ H01J *3/14*
U.S. Cl. 250—216 **14 Claims**



1. A constant magnification optical tracking system for continuously tracking a moving object, said system comprising:

a traveling objective lens for providing a substantially collimated light beam substantially parallel to an average direction of travel of said moving object, said objective lens having a focal length substantially equal to the optical distance between said moving object and said traveling objective lens;

first means for causing said moving object to be substantially located at the focal point of said traveling objective lens for at least a portion of a path followed by said moving object; and

second means located in said collimated light beam for observing said moving object.

4,320,291
OPTICAL INSTRUMENT

Hiromu Uramoto, Takatsuki, Japan, assignor to Yuasa Battery Company Limited, Takatsuki, Japan

Continuation-in-part of Ser. No. 967,985, Dec. 11, 1978, abandoned, which is a continuation-in-part of Ser. No. 804,298, Jun. 1, 1977, abandoned. This application Dec. 3, 1979, Ser. No. 99,823
Claims priority, application Japan, Oct. 20, 1976, 51-126628
Int. Cl.³ G02B *5/14*
U.S. Cl. 250—227 **12 Claims**

1. An optical instrument for measuring the specific gravity of a solution, said instrument comprising

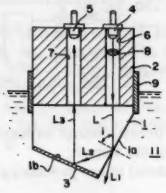
an elongated base body having a first end and a second end,

a light-emitting means located near said first end of the elongated base body for emitting a ray of non-divergent light through the elongated base body,

a photosensitive element located near said first end of the elongated base body for sensing light passing through the

elongated base body in parallel with said ray of nondivergent light emitted by said light-emitting means, and

a transparent glass member having a refractive index value of not less than 1.5 sealingly connected to said second end of the elongated base body, said glass member including only two light-contacting surfaces which consist of (a) an incident light surface which is positioned and inclined such that said ray of non-divergent light emitted from said



light-emitting means will strike the incident light surface and be divided into a light portion entering the solution in which the optical instrument is partly immersed and a reflected portion, and (b) a reflector surface; said reflector surface including a reflective coating enabling 100% of the light hitting said reflector surface to be redirected towards said photosensitive element in a direction parallel to the ray of non-divergent light emitted from said light-emitting means.

4,320,292

COORDINATE INPUT APPARATUS

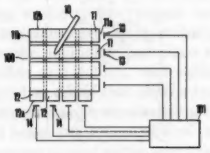
Shigeru Oikawa; Yuzo Katayama; Norio Takato, and Takashi Kurokawa, all of Mito, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

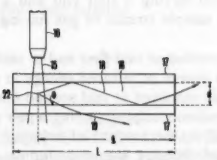
PCT No. PCT/JP78/00035, § 371 Date Aug. 22, 1979, § 102(e) Date Aug. 22, 1979, PCT Pub. No. WO79/00436, PCT Pub. Date Jul. 12, 1979

PCT Filed Dec. 1, 1978, Ser. No. 154,407

Int. Cl.³ G06F *3/02*; G06K *9/00*

U.S. Cl. 250—227 **17 Claims**





1. A coordinate input apparatus comrising an input board (**100**) including two optical guide arrays superposed one upon the other with the optical guide channels of one array intersected at right angles with the optical guide channels of the other array, each array having a plurality of paralelly disposed optical guide channels (**11, 12**), each channel containing an optical scatterer (**22**); a light pen (**10**) adapted to project a light beam upon said input board; photo detector (**13, 14**) disposed to oppose one end surface (**11*a*, 12*a***) of said respective optical guide channels for detecting scattered light of said projected light beam and propagating through said optical guide channels to convert the detected light into electrical signals; and an electronic circuit (**101**) responsive to said electrical signals for producing a binary signal train which determines a coordinate position where said light beam is projected by said light pen.

4,320,293

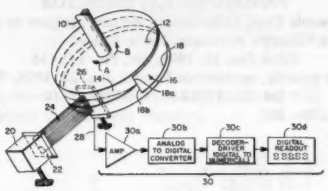
ANGLE-POSITION TRANSDUCER

Harold Guretzky, 56-05 Clearview Exp., Bayside, N.Y. 11364

Continuation of Ser. No. 934,680, Aug. 30, 1978, abandoned. This application Aug. 22, 1980, Ser. No. 180,335

Int. Cl.³ G01D *5/34*

U.S. Cl. 250—231 SE **15 Claims**



1. Apparatus for determining angular displacement including an optical track in the form of a single triangle disposed in continuous manner along the region of angular interest, means for producing a source of radiation, the angular displacement to be measured being determined by relative angular movement between said optical track and said radiation source means, said radiation source means having an output in the form of a vanishingly thin line-beam of constant intensity which is directed to impinge broadside on said optical track and thereby illuminate a vanishingly thin line-pattern thereon, and transducer means spaced from and aligned relative to said optical track so as to intercept said line-pattern after same impinges on said optical track and produce an output porportional thereto, said optical track interacting with and altering said line-pattern in a continuous and uninterrupted manner whereby the altered line-pattern received by said transducer means exhibits one-to-one correspondence with, and is a linear analog of, said relative angular movement.

4,320,294

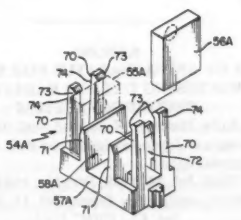
CONTROL DEVICE AND METHOD OF MAKING THE SAME

Charles J. Everett, Clinton, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 76,407, Sep. 17, 1979. This application Dec. 17, 1980, Ser. No. 217,395

Int. Cl.³ G01D *5/34*

U.S. Cl. 250—231 P **12 Claims**



1. In a control device having a housing means provided with an actuator chamber separated from a pressure differential chamber by wall means having opening means therethrough receiving a movable actuator pin that transmits movement of a movable part in said pressure differential chamber to said actuator chamber and is operatively interconnected to one end

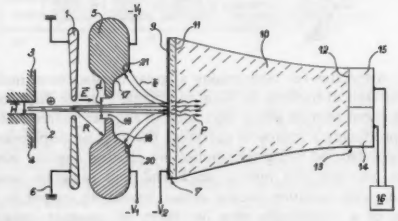
of an adjustable range spring disposed in said actuator chamber and tending to move said actuator pin in one direction relative to said housing means, the improvement comprising a U-shaped bridge member disposed in said actuator chamber and haivng a pair of legs straddling said range spring and a cross member adjacent the other end of said range spring, said bridge member being separate from said housing means and being completely confined within said actuator chamber, said cross member carrying adjusting means for adjusting said other end of said range spring relative to said housing means.

4,320,295

PANORAMIC ION DETECTOR

Jean-Francois Eloy, Saint-Ismier, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 10, 1980, Ser. No. 111,116
Claims priority, application France, Jan. 23, 1979, 79 01632
Int. Cl.³ H01J *3/14*; B01D *59/44*
U.S. Cl. 250—281 **5 Claims**



1. A panoramic detector for ions spatially distributed in different beams, said detector comprising a diaphragm with plane symmetry having an opening and brought to a given potential, an accelerating electrode having an opening facing the opening in the diaphragm, said accelerating electrode having a plane symmetry and being brought to a negative potential compared with that of the diaphragm, a plane electrode facing the accelerating electrode and extending across the aperture in said accelerating electrode so that ions passing through the aperture in said accelerating electrode will impinge on said plane electrode, said plane electrode being brought to a negative potential compared with that of the diaphragm, the absolute value of the potential of the plane electrode being greater than the absolute value of the potential of the accelerating electrode and a plurality of processing means for processing electron signals emitted from differing zones of the plane electrode as a result of ion impacts, said plurality of processing means comprising a scintillator and a plurality of light guides, each associated with one of the zones of the scintillator, juxtaposed along the direction of said plane of symmetry.

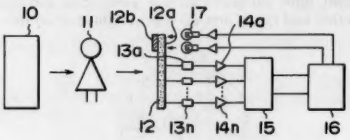
4,320,296

METHOD OF AND APPARATUS FOR RECORDING IMAGE PROCESSING DATA IN RADIATION IMAGE RECORDING SYSTEM

Masamitsu Ishida; Hisatoyo Kato, and Seiji Matsumoto, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 11, 1980, Ser. No. 168,803
Claims priority, application Japan, Jul. 11, 1979, 54-87798
Int. Cl.³ G03C *5/16*
U.S. Cl. 250—327.1 **14 Claims**

1. In a radiation image recording method in which a stimulable phosphor is exposed to an imagewise radiation transmitted through an object to store the energy of the radiation and record a latent image of a radiation image, the stimulable phosphor is then exposed to stimulating rays to read out the recorded image in the form of the stored energy of radiation thereon, light spontaneously emitted from the stimulable phosphor upon exposure of the stimulable phosphor to the imagewise radiation is photoelectrically detected over the entire area of the image to obtain information of the image, and the obtained image information is fed to an arithmetic and logical unit



to calculate various desired image processing data, the improvement comprising the step of

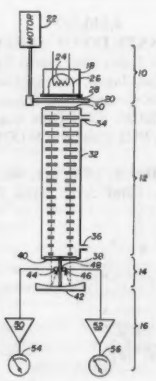
recording the calculated image processing data on the stimulable phosphor.

4,320,297

SPLIT DETECTOR

Carl N. Cederstrand, Brea, and Hoke R. Chism, Jr., Anaheim, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 29, 1979, Ser. No. 98,469
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—343 **9 Claims**



1. An infrared gas analyzer comprising:

one sample cell having a first end and a second end for receiving a sample stream of gas having several components;

one source mounted at said first end of said sample cell for providing a source of infrared energy in said sample cell;

detector means mounted at said second end of said sample cell and simultaneously producing a pair of output signals proportional to the amount of infrared energy incident thereon, said detector means including a substrate provided with a slot and first and second infrared responsive devices mounted on respective sides of said slot;

first band-pass filter means mounted between said source and said detector means for passing a band of radiation at a first selected wavelength;

second band-pass filter means mounted between said source and said detector means for passing a band of radiation at a second selected wavelength; and

separator means located between said first filter means and said second filter means for supporting said detector means and for preventing interchange of radiation between said first and said second selected wavelengths, said

separator means fitting into the slot in said substrate to position the infrared responsive devices of said detector means to receive infrared energy through respective bandpass filter means.

4,320,298

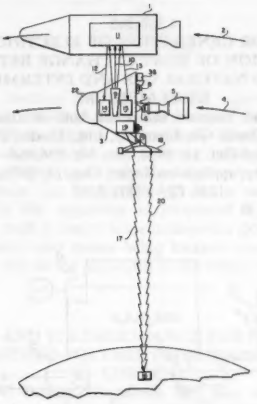
WARHEAD DETECTOR

William H. Buford, Jr., Granada Hills, and John J. Wagner, Woodland Hills, both of Calif., assignors to The Marquardt Corporation, Van Nuys, Calif.

Filed Apr. 27, 1962, Ser. No. 190,830

Int. Cl.[2] G01N *23/00*

U.S. Cl. 250—358 R **3 Claims**



1. Apparatus for the interception of an artificial earth orbiting satellite and the detection of thermonuclear material therein comprising, an interceptor vehicle having means for establishing and maintaining a given attitude in space with respect to said satellite, high-energy electron beam generating means carried within said vehicle, said attitude maintaining means being adapted to direct said eletron beam toward said satellite and thereby produce bremsstrahlung from the interaction between said beam and the surface of said satellite, and neutron detector means carried within said vehicle and responsive to neutrons radiated from said satellite as a result of the interaction of said bremsstrahlung with thermonuclear material contained within said satellite.

4,320,299

POSITION-SENSITIVE NEUTRAL PARTICLE SENSOR

James E. Bateman, Abingdon, and John F. Connolly, Reading, both of England, assignors to National Research Development Corporation, London, England

Filed Jun. 14, 1978, Ser. No. 915,553

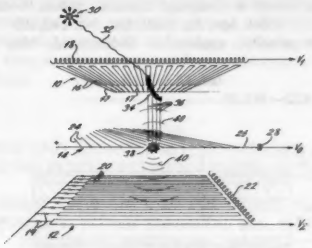
Claims priority, application United Kingdom, Jun. 24, 1977, 26595/77

Int. Cl.[3] G01T *1/18*

U.S. Cl. 250—374 **12 Claims**

1. A cathode plate for use in a position-sensitive neutral particle sensor comprising:

a thin insulating support having on each face a cathode array of spaced metal strips arranged adjacent and edge to edge, the metal of which the strips are formed being such that an incident neutral particle is converted to a fast electron which escapes from the cathode plate, and



the thickness of each strip being approximately half the thickness theoretically required.

4,320,300

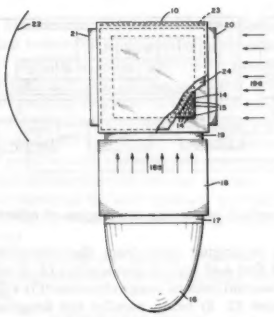
ISOTOPE SEPARATION BY SOLAR PHOTOIONIZATION

Raymond P. Mariella, Jr., Madison, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Sep. 28, 1979, Ser. No. 79,751

Int. Cl.[3] B01J *1/10*; H01J *39/34*

U.S. Cl. 250—423 P **19 Claims**



1. A process for separating a particular isotope of an element from a beam of atoms of the particular isotope and at least one other isotope of the element which comprises:

(a) exposing the beam to electromagnetic radiation of a predetermined wavelength to selectively excite atoms of the particular isotope of the element to an excited electronic state without substantially exciting atoms of other isotopes of the element,

(b) exposing the beam to solar radiation to selectively ionize the excited atoms of the particular isotope without substantially ionizing atoms containing other isotopes of the element and

(c) separating ions of the particular isotope from the remainder of the beam.

4,320,301

DEVICE FOR THE PRODUCTION OF OZONE

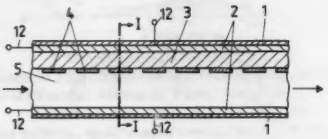
Ulrich Kogelschatz, Hausen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Apr. 21, 1980, Ser. No. 142,480

Claims priority, application Switzerland, May 22, 1979, 4782/79

Int. Cl.³ C01B *13/11*

U.S. Cl. 422—186.18 9 Claims



1. An ozonizer, comprising:

a pair of electrodes;

a non-conductive layer provided on the surface of at least one electrode facing the other electrode; and

an electrically conductive layer forming electrically separated islands provided on said non-conductive layer.

4,320,302

METHOD FOR THE AUTOMATIC OR SEMIAUTOMATIC DISTANCE MEASUREMENT AND FOCUSING OF THE IMAGE OF AN OBJECT ONTO A FOCAL PLANE

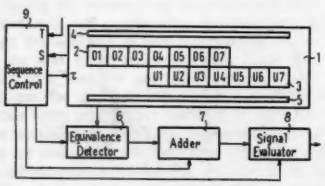
Karl U. Stein, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 27, 1979, Ser. No. 69,788

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1978, 2838647

Int. Cl.³ H01J *40/14*; G03B *7/08*; G01C *3/00, 5/00*

U.S. Cl. 250—578 7 Claims



1. In a method of sensing the degree of offset of split light images,

(a) sensing impinging light from the respective images by means of first and second line sensors (2, 3) which provide first and second lines of image elements (O1-O7, U1-U7), the line sensors (2, 3) being parallel but longitudinally offset relative to each other, with the first line sensor (2) having a first series of image elements (O1-O3) offset longitudinally from the second line sensor (3) and having a second series of image elements (O4-O7) laterally aligned with a first series of image elements (U1-U4) of the second line sensor (3), and with the second line sensor (3) having a second series of image elements (U5-U7) offset longitudinally from the first line sensor (2), the second series of image elements (O4-O7) of said first line sensor (2) having the same predetermined number of image elements as the first series of image elements (U1-U4) of said second line sensor (3),

(b) deriving from the image elements of said first and second line sensors respective sets of output signals,

(c) digitally processing the output signals from the first and second line sensors (2, 3) to produce first and second subsets of digitalized measurement results (at 6-1, 6-2, etc., FIG. 2; at 6-I, 6-II, etc. FIG. 5) with each first subset of digitalized measurement results digitally representing the output signals from a subgroup of successive image elements of the first line sensor having said predetermined number of image elements and with each second subset of digitalized measurement results digitally representing the output signals from a subgroup of successive image elements of the second line sensor having said predetermined number of image elements, and

(d) sequentially examining the first and second subsets of digitalized measurement results to determine which of said first and second subsets have respectively matching pairs of digitalized measurement results so as to determine which of the respective subgroups of successive image elements of the first and second line sensors (2, 3) have supplied respectively matching pairs of output signals.

4,320,303

SYSTEM FOR GENERATION OF ELECTRICITY BY UTILIZATION OF HEAT EXCHANGE BETWEEN LIQUEFIED NATURAL GAS AND INTERMEDIATE HEAT MEDIUM

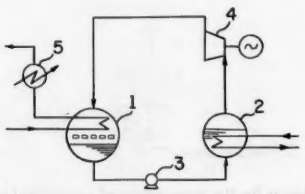
Isami Ooka, and Yosinori Hisazumi, both of Osaka, Japan, assignors to Osaka Gas Company, Ltd., Osaka, Japan

Filed Oct. 14, 1980, Ser. No. 196,964

Claims priority, application Japan, Oct. 11, 1979, 54-131371

Int. Cl.³ F28D *7/10*

U.S. Cl. 290—1 R 2 Claims



1. A system for generation of electricity which comprises warming an intermediate heat exchange medium, cooled and liquefied as the result of having been used for warming LNG to vaporize the LNG with water or sea water to vaporize the medium, introducing the vaporized intermediate heat exchange medium into a turbine equipped with an electric power generator thereby driving the generator and then using the intermediate heat exchange medium discharged from the turbine to warm LNG to vaporize it while the intermediate heat exchange medium discharged from the turbine is contacted with condensed liquid intermediate heat exchange medium in contact with a packing material.

4,320,304

APPARATUS FOR INCREASING THE FLOW SPEED OF A MEDIUM AND FOR RECOVERING ITS KINETIC ENERGY

Jan Karlsson, Gothenburg, and Gert Raimel, Asa Station, both of Sweden, assignors to New Environment Energy Development Aktiebolag (NEED), Gothenburg, Sweden

Filed Jan. 24, 1979, Ser. No. 6,121

Claims priority, application Sweden, Jan. 30, 1978, 7801112; Jan. 10, 1979, 7900241

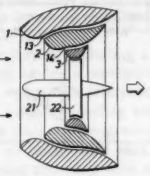
Int. Cl.³ F03D *9/00*; H02P *9/04*; F03D *7/00*; F02K *3/00*

U.S. Cl. 290—55 2 Claims

1. Apparatus for increasing the flow speed of a medium, such as air, and for recovering its kinetic energy, the apparatus comprising:

a series of annular members arranged symmetrically and separated by annular slots, said members being located

coaxially with the longitudinal axis of the apparatus, which axis coincides with the flow direction of the medium, each of said members having an aerodynamically curved annular leading edge facing the flow of the medium and a tapered end in the opposite direction pointing essentially outwards from said longitudinal axis, the combined curved annular leading edges of the members defining an essentially conical inlet opening acting as a flow speed accelerator for the medium, said inlet opening having a decreasing cross-sectional area in the flow direction



of the medium and the combined tapered ends of the members defining an essentially conical outlet opening for the medium acting as a divergently directing diffuser for the medium, said outlet opening having an increasing cross-sectional area in the flow direction of the medium; and wherein the kinetic energy of the medium flowing through the apparatus is recovered by conventional means, such as one or more turbines for driving an electric generator, said means being located coaxially with the center axis of the apparatus in the center thereof.

4,320,305

METHOD AND VOLTAGE SOURCE FOR PRODUCING A SMOOTHED VOLTAGE FROM THREE-PHASE CURRENT

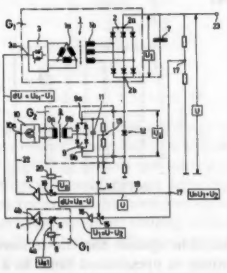
Friedrich W. Thomas, Hasselroth, Fed. Rep. of Germany, assignor to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Feb. 26, 1980, Ser. No. 124,684

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1979, 2907580

Int. Cl.³ H02M 7/19

U.S. Cl. 307—6 **4 Claims**



1. A method for converting a three phase input into a constant voltage to a load, which voltage is substantially free of harmonics and ripples, the method comprising continuously repeating in a closed loop, receptive of the three phase input, the steps of: dividing the voltage to the load into two component voltages, with one component voltage comprising at least 80% of the total; maintaining the one component voltage constant and load independent; comparing the voltage to the load to a first reference voltage to obtain the difference therebetween; adjusting the value of the other component voltage to minimize said difference; and adding the two component voltages to form the voltage to the load; and wherein the step of maintaining the one component voltage constant comprises subtracting the other component voltage from the voltage to the load, comparing the result to a second reference voltage, and regulating the magnitude of the three phase input seen by the closed loop to minimize any difference between the compared voltages.

4,320,306

METHOD AND APPARATUS FOR CONTROLLING CURRENT OR POWER BETWEEN INTERCONNECTED POWER STATIONS

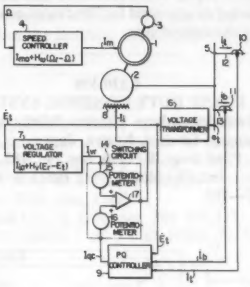
Masayuki Kohga, Tokyo, and Shigemitsu Taguchi, Tama, both of Japan, assignors to Shoei Electric Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,257

Claims priority, application Japan, Jul. 13, 1979, 54-88950

Int. Cl.³ H02J 3/18

U.S. Cl. 307—51 **14 Claims**



1. A method for controlling a current or power between interconnected power stations comprising:

first step of measuring a deviation from a base load in an active current or power produced from a specific power station;

second step of measuring a deviation from a normal value in the terminal voltage of said specific power station;

third step of yielding a linear function of the ratio of said voltage deviation to said current or power deviation;

fourth step of yielding a product of said function of ratio and an active current flowing out of an arbitrary power station interconnected with said specific power station;

fifth step of yielding a resultant of said active current and a reactive current represented by said product;

sixth step of summing up said resultant current and other currents of said power station including the internal load current; and

seventh step of making the internal generation current of said power station coincident substantially with said sum of currents.

4,320,307

ARRANGEMENT FOR INTERFERENCE SUPPRESSION OF ELECTROMAGNETIC CIRCUITS

Rudolf Schierjott, Germering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 13, 1980, Ser. No. 177,626

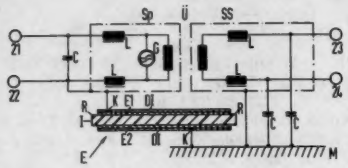
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1979, 2937539

Int. Cl.³ H05K 9/00

U.S. Cl. 307—91 **5 Claims**

1. An arrangement for reducing electromagnetic interference in an electronic circuit which does not have mains separation at an input side and which generates high-frequency noise voltages, comprising: said circuit having a shielded input por-

tion at the input side and a shielded output portion at an output side electrically separated by means of a transformer and having a filter circuit arranged at the input side and output side; a large-surface printed circuit board having surface-wide electrodes substantially covering both surfaces arranged between



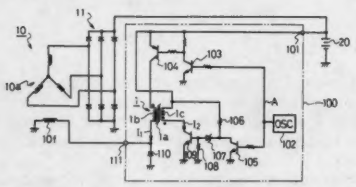
the shielded circuit portion at the input side and the shielded circuit portion at the output side, the one electrode being connected to a shield at the input side and its other electrode being connected to a ground for the circuit portion allocated to the shield at the output side.

4,320,308

PULSE DUTY CONTROL SYSTEM

Shinichiro Iwasaki, Auburn Heights, Mich., assignor to Aisin Seiki Company, Limited, Kariya, Japan

Filed Aug. 29, 1980, Ser. No. 182,675
Int. Cl.³ H03K *3/00*; H02J *7/00*
U.S. Cl. 307—106 **9 Claims**



1. A pulse duty control system, comprising:

a pulse duty controlling element including a core made of an amorphous magnetically soft material having a first and a second electrical coil disposed thereon, said first electrical coil having a first terminal coupled to an output terminal of said system, said second electrical coil having a first terminal coupled to a first terminal of a voltage source;

pulse generator means for producing a pulse signal of a given frequency;

current controlling means coupled to a second terminal of said second electrical coil for controlling a current flowing through said second electrical coil;

control circuit means for applying a control voltage to said current controlling means, said control voltage controlling the amplitude of said current flowing through said second electrical coil;

a first switching circuit coupled to a second terminal of said first electrical coil, said first switching circuit having an input coupled to receive said pulse signal from said pulse generator means, said first switching circuit allowing a current to flow through said first electrical coil during a portion of a first half-period of said pulse signal;

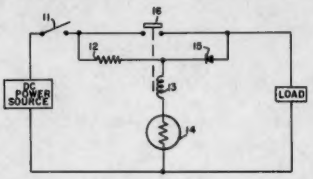
a second switching circuit coupled to said current controlling means, said second switching circuit having an input coupled to receive said pulse signal produced by said pulse generator means, said second switching circuit allowing said current to flow through said second electrical coil during a portion of a second half-period of said pulse signal.

4,320,309

OSCILLATORY CIRCUIT UTILIZING PTC RESISTOR

Charles R. Griffiths, Standish, and William G. Ferguson, Cumberland Center, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 31, 1979, Ser. No. 108,616
Int. Cl.³ H01H *61/06*
U.S. Cl. 307—132 T **1 Claim**



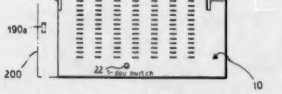
1. A control circuit for applying power to a load in accordance with a predetermined on-off cycle comprising: a power source; a switch in series with the power source; the combination of a resistor, a relay coil and a PTC resistor forming a first series circuit between the switch and the power source; the combination of a pair of contacts and a load forming a second series circuit between the switch and the power source, the second series circuit being in parallel to the first series circuit, the pair of contacts being energizable by the relay coil; and a diode electrically connected at one end to a point between the resistor and the relay coil and at the end to a point between the pair of contacts and the load.

4,320,310

AUTOMATIC CONTROL SYSTEM INCLUDING A PROGRAMMABLE MEMORY WITH MANUALLY INSERTABLE JUMPERS

Alois Knoll, Schönaich, Fed. Rep. of Germany, assignor to Firma Centra-Bürkle GmbH & Co., Schönaich, Fed. Rep. of Germany

Filed Apr. 10, 1980, Ser. No. 135,767
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914611
Int. Cl.³ H01H *7/00*
U.S. Cl. 307—141 **6 Claims**



1. A programmable system for the automatic control of switching operations at preselected times in a program cycle divided into a multiplicity of time intervals of changeable duration, comprising:

memory means including a multiplicity of primary and secondary conductors forming two intersecting arrays;

manually settable connector means for electrically bridging a selected primary conductor and a selected secondary conductor to form any of a multiplicity of potential junctions each identifying the beginning of a respective time interval;

clock means providing real-time digital readings of said time intervals;

evaluating means including circuitry timed for sequentially energizing said primary conductors and scanning said

secondary conductors in a recurrent operating period substantially shorter than the shortest of said time intervals with generation of an output signal upon the scanning of any secondary conductor connected to an energized primary conductor, said evaluating means further including decoding means for detecting the identity of the time interval assigned to the junction giving rise to said output signal and for emitting a switching command upon said identity matching the current reading of said clock means; and

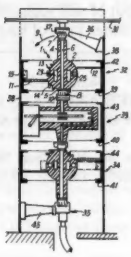
changeover means connected to said evaluating means for selectively modifying the operation of said decoding means to alter the temporal significance of output signals obtained from said junctions;

said memory means further including a cover plate overlying said arrays and having a multiplicity of first apertures registering with respective intersections of said arrays, said changeover means including switch means on said cover plate and at least one program plate positionable on said cover plate to coact with said switch means, said program plate being provided with a multiplicity of second apertures registering with at least some of said first apertures upon emplacement of said program plate on said cover plate, said connector means including jumpers insertable into aligned first and second apertures.

4,320,311
COMBINATION ISOLATING SWITCH AND CURRENT TRANSFORMER

Jean P. Avocat, Lambres lez Douai, France, assignor to S.A. Douaisienne de Transformateurs Electriques de Mesure, Douai, France

Filed Mar. 18, 1980, Ser. No. 131,103
Claims priority, application France, Mar. 28, 1979, 79 08412
Int. Cl.³ H02B *13/02*
U.S. Cl. 307—147 **12 Claims**



1. An isolating switch for use in a voltage cell having fixed electrical contact means connected to a source of power, said isolating switch providing at least the isolating switch function and the disconnection function for an adjacent circuit breaker apparatus, characterized by the combination of

(a) at least one frame mounted slidably internally of the cell, said slidable frame having a fixed electrical contact means connected to ground,

(b) a movable assembly mounted rotatably on the slidable frame with capacity for pivotal movement, said movable assembly comprising

(i) an oscillatable rotary cylinder formed of insulating material and pivotal about its longitudinal axis,

(ii) a handle connected to the cylinder for turning the cylinder through an amplitude of a quarter of a turn,

(iii) a plurality of axially spaced co-planar isolating switch poles formed integrally with the cylinder and extending diametrically through the cylinder, each said pole including a pair of co-axial insulation-covered conductor arms containing a diametral conductive core, said arms extending from opposite sides of the cylinder and being of unequal length,

(iv) contact means disposed at the outer ends of the longer conductor arms, said contact means being connectable with the fixed contact means of the cell when the isolating switch is in the closed position and being connectable with the fixed contact means of the slidable frame when the isolating switch is in the open position, and

(v) contact means disposed at the outer ends of the shorter conductor arms, said contact means being connectable with the adjacent circuit breaker apparatus when the isolating switch is in the closed position aforesaid,

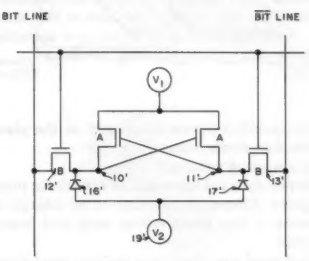
(vi) said long arm and short arm contact means at each pole being connected by the diametral conductive core at each pole, and

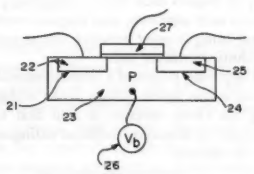
(c) screens affixed to the slidable frame on opposite sides of the movable assembly and extending in the direction of the cylinder to come as close as possible to the cylinder without touching it, one screen being conductive and the other screen being insulating, said two screens being offset relative to the axis of the cylinder to provide a distance between the screens not less than the space occupied by the arms when the isolating switch is in the open position aforesaid.

4,320,312
SMALLER MEMORY CELLS AND LOGIC CIRCUITS

Laurence G. Walker, Palo Alto; James D. Sansbury, Portola Valley; Robert D. Rung, Jr., Menlo Park, and Juliana Manoliu, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 2, 1978, Ser. No. 947,377
Int. Cl.³ H03K *5/00, 17/60;* H01L *29/78*
U.S. Cl. 307—238.8 **6 Claims**





1. A logic circuit comprising:

a first voltage source of voltage V_1;

a second voltage source of voltage V_2;

a leaky MOSFET having a bulk region connected to the second voltage source to bias the bulk region at V_2 and having a doped region forming a leaky p-n junction of conductance g with the bulk region, said MOSFET being of the conduction type for which a bulk bias V_2 preserves a reverse bias on said junction for doped region voltages in the range between V_1 and V_2; and

a variable conductance device having a first electrode con-

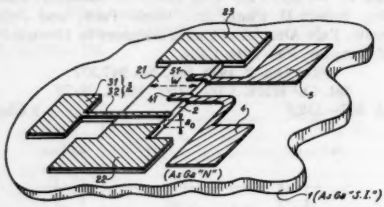
nected to the first voltage source, a second electrode connected to the doped region of the MOSFET and a logic input responsive to logic signals to control the conductance between its first and second electrodes to assume either a high conductance value greater than g or a low conductance value less than g, whereby said leaky junction and said variable conductance device are connected in series between the first and second voltage sources and whereby the voltage of the doped region assumes a first logic voltage level representing a first logic state when the variable conductance device assumes its high conductance value and whereby the voltage of the doped region assumes a second logic voltage level representing a second logic state when the variable conductance device assumes its low conductance value.

4,320,313

GUNN-EFFECT DEVICE MODULATABLE BY CODED PULSES, AND A PARALLEL-SERIES DIGITAL CONVERTER USING SAID DEVICE

Maurice Gloanec, and Rene Castagne, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 889,659, Mar. 21, 1978, abandoned. This application Sep. 13, 1979, Ser. No. 75,537
Claims priority, application France, Mar. 25, 1977, 77 08998
Int. Cl.³ H01L *47/02, 27/26*
U.S. Cl. 307—243 **6 Claims**



1. A Gunn-effect device integrated on the planar-side of a semiconductor device comprising:

a semi-insulating substrate

an n-doped epitaxial layer able to exhibit the phenomenon of negative differential mobility of its charge carriers and forming a first band whose each end bears an ohmic contact;

a second band narrower than the first band extending laterally from the first band and terminated by a larger area, said second band bearing a Schottky contact;

a plurality of fingers each finger comprising a metallization formed on said substrate, said fingers overlapping the first band and being located between the second band and one of the ohmic contacts; and

means for applying pulses of a predetermined voltage to said fingers to create space charge zones within said bands for limiting the Gunn domain in said first band under said fingers and for lessening without extinguishing a current within the device.

4,320,314

SEQUENTIAL LOGIC ELEMENT

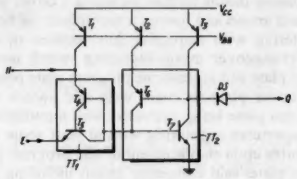
Ngu T. Pham, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 17, 1979, Ser. No. 104,549
Claims priority, application France, Dec. 19, 1978, 78 35636
Int. Cl.³ H03K *3/288, 3/352*
U.S. Cl. 307—288 **3 Claims**

1. A sequential logic element with a memory having an analog gate and a flip-flop with a single output, wherein it comprises:

a first, a second and a third transistor, constituting a first, a second and a third steady current source;

an analog gate constituted by one of a p-n-p-n and n-p-n-p-type structure formed by a fourth and a fifth complementary transistor, one of these being a lateral type transistor and the other being a transverse type transistor, said analog gate having a first input, a second input and an output, said first input being connected to the emitter of the fifth transistor and said output being connected to the collector of the fifth transistor, the emitter of the fourth transistor being connected to the first steady current source and to said second input, said second input being connected to a source of timing signals;



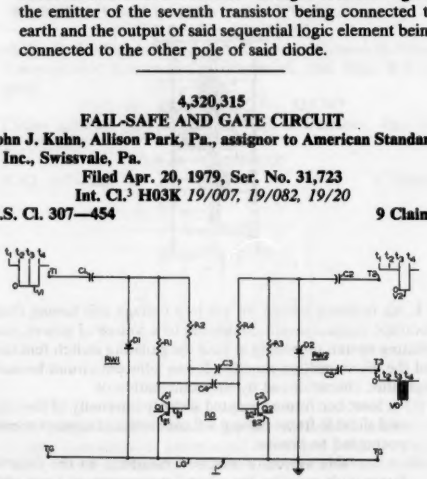
a flip-flop constituted by a sixth and a seventh complementary transistor, one being a lateral type transistor and the other being a transverse type transistor, said flip-flop having an input, the emitter of the sixth transistor being connected to the second steady current source, the base of the sixth transistor and the collector of the seventh transistor being connected to the third steady current source and to one pole of a diode, the input of the flip-flop being connected to the base of the seventh transistor, to the collector of the sixth transistor and to the output of the analog gate, the base of the seventh transistor and the collector of the sixth transistor having a common region, the emitter of the seventh transistor being connected to earth and the output of said sequential logic element being connected to the other pole of said diode.

4,320,315

FAIL-SAFE AND GATE CIRCUIT

John J. Kuhn, Allison Park, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Apr. 20, 1979, Ser. No. 31,723
Int. Cl.³ H03K *19/007, 19/082, 19/20*
U.S. Cl. 307—454 **9 Claims**



1. A fail-safe logic circuit comprising, a free-running multivibrator having a first and a second transistor, a first voltage reference network including a first coupling capacitor and a first zero voltage reference diode coupled to said first transistor, and a second voltage reference network including a second coupling capacitor and a second zero voltage reference diode coupled to said second transistor so that said free-running multivibrator produces a.c. oscillations when and only when said first voltage reference network supplies biasing and

operating potentials to said first transistor and said second voltage reference network supplies biasing and operating potentials to said second transistor.

4,320,316

OPERATION TIME CONTROL APPARATUS

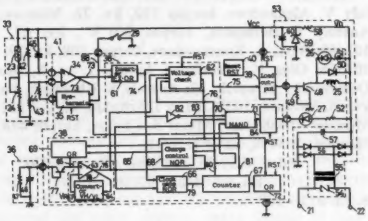
Horoshi Horii, Kashihara; Masao Itou, Nara; Hidenosuke Matsumoto, and Toshio Marumo, both of Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 16, 1980, Ser. No. 140,779

Claims priority, application Japan, Apr. 26, 1979, 54-052099

Int. Cl.³ H03K *5/13, 5/159*

U.S. Cl. 307—595 **4 Claims**



1. An operation time control apparatus comprising

a comparator **(34)** which issues ON-output signal and OFF-output signal responding to input signal thereto,

a timer circuit **(36)** including a capacitor which is charged with said ON-output signal and is made to discharge upon issuing of said OFF-output,

a dual level comparator **(65)**, output signal of which turns off when an output voltage of said timer circuit **(36)** at the time after a turning off of said comparator **(34)** decreases to a lower reference voltage V_L and turns on when the output voltage of said timer circuit **(36)** restores to a higher reference voltage V_H,

a counter **(67)** which counts OFF-signals issued from said dual level comparator **(65)** when said comparator **(34)** turns off, and issues a first output signal based on a first output of said dual level comparator **(65)** and a time-end output signal when a predetermined number of said OFF-signals are counted,

a charge control circuit **(68)** which, during a time period from the issuing of said first output signal to the issuing of said time end output signal, makes the charging of said capacitor with an OFF-output from said dual level comparator **(65)**, and

a prevention circuit **(62)** which prevent transfer of output of said comparator **(34)** to an output circuit **(39)** during a time period (T_2) from a turning off of the output of said comparator **(34)** to said issuance of said first output signal.

4,320,317

MOTOR OVERLOAD SAFETY DEVICE

John J. Bowey, Unit 2, 1 Hazel St., Ascot Park, State of South Australia, Australia

Filed Mar. 21, 1980, Ser. No. 132,526

Claims priority, application Australia, Mar. 23, 1979, PD 8195

Int. Cl.³ H02K *11/00*

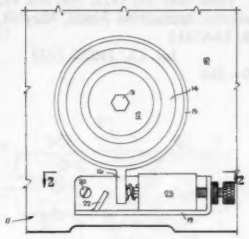
U.S. Cl. 310—68 B **9 Claims**

1. A motor safety device overload responsive to reduction of angular velocity of a rotor in a motor, which has a rotor having a shaft journalled for rotation in bearings in a stator, and power means to induce said rotation, comprising:

bearing means providing bearing friction and being freely rotatable on and carried by the rotor, said bearing means having an operator thereon,

switch means arranged to be actuated by the operator by rotational force of the rotor imparted to the operator by said friction of the bearing means,

and resilient return means engaged by the operator and operable to release the operator from said switch means



actuation upon reduction of said bearing friction occasioned by reduction of rotor angular velocity,

said switch means controlling disconnection of said power means upon said release from said switch means actuation.

4,320,318

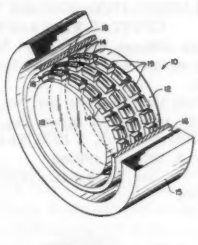
BRUSH ACTUATION MECHANISM

William F. Weldon, Austin, Tex., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 735,874, Oct. 26, 1976. This application Apr. 25, 1978, Ser. No. 900,037

Int. Cl.³ H02K *13/00*

U.S. Cl. 310—219 **10 Claims**



1. In a system which includes a rotor, a ring of sliding electrical contacts disposed proximate a curved peripheral surface of said rotor, and conductive means connected to said sliding electrical contacts for communicating a transfer current to and from said rotor through said sliding electrical contacts, an improved system for controlling the location of the sliding electrical contacts relative to the rotor comprising:

means for generating a magnetic field generally parallel to the axis of the rotor;

an electrical conductor having a generally circular portion proximate the ring of sliding electrical contacts;

means for mechanically coupling the sliding contacts and electrically isolating said contacts from the circular portion of the electrical conductor; and

means for generating an electric current through the circular portion of the electrical conductor to induce a magnetic force to act upon said circular portion in a direction that varies the degree of frictional engagement of the sliding contacts with the rotor.

4,320,319

IRONLESS ROTOR WINDING FOR ELECTRIC MOTOR, METHOD AND MACHINE FOR MAKING THE SAME

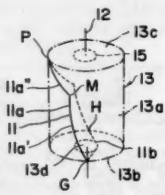
Yuji Takahashi, 609-3, Horinishi, Hatano-shi, Kanagawa-ken, Japan

Filed May 21, 1979, Ser. No. 41,182

Claims priority, application Japan, May 31, 1978, 53-64375; Jun. 6, 1978, 53-67312

Int. Cl.[3] H02K *1/22*

U.S. Cl. 310—266 5 Claims



1. An ironless cup-shaped rotor for an electric motor comprising a cylindrical body formed from a continuous winding of consecutive closely spaced turns of heat-treated self-bondable wire, each said turn including a first portion forming a first terminate face of an said cylindrical body, said first portion lying generally in a plane at right angles to the axis of said cylindrical body, a second portion disposed upon the circumference and lying at a first angle to the axis of said cylindrical body, a third portion disposed at the circumferential edge of the other terminate face of said cylindrical body, and a fourth portion also disposed upon the circumference of, and at a second angle substantially equal to said first angle to the axis of said cylindrical body, each said turn being held in place by a heat-treated subsequent turn of said self-bondable wire to form said cylindrical body into a rigid cup-shaped rotor.

4,320,320

COUPLED MODE TUNING FORK TYPE QUARTZ CRYSTAL VIBRATOR

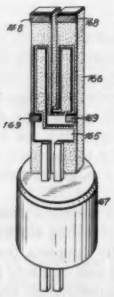
Eishi Momosaki; Shigeru Kogure, and Minoru Inoue, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 29, 1979, Ser. No. 42,732

Claims priority, application Japan, Dec. 1, 1978, 53-149499; Dec. 1, 1978, 53-149500; Dec. 4, 1978, 53-150182; Dec. 4, 1978, 53-150183; Dec. 4, 1978, 53-150186

Int. Cl.[3] H01L *41/08*

U.S. Cl. 310—361 45 Claims



1. A quartz tuning fork vibrator for a timekeeping device, said vibrator having at least two modes of vibration, said vibrator comprising quartz crystal formed in the shape of a tuning fork, said tuning fork including a base portion and arms extending therefrom, at least said arms having electrodes formed thereon, said quartz crystal having electrical X, mechanical Y, and optical Z axes, and said vibrator formed by cutting said quartz crystal at a selected cutting angle relative to said axes to form a quartz crystal plate, said quartz crystal plate having a selected thickness whereby the frequency difference between the first and second modes of vibration is no greater than 15% of said first mode of vibration, whereby a favorable frequency-temperature characteristic is provided.

4,320,321

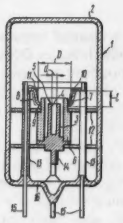
HOLLOW-CATHODE GAS-DISCHARGE TUBE

Vitaly V. Alexandrov, korpus 610, kv. 22, Moscow, 103489; Anatoly I. Bezlepkin, korpus 200"V", kv. 61, Moscow, 103460; Boris A. Konstantinov, korpus 508, kv. 29, Moscow, 103536; Olga V. Melnikova, korpus 1, kv. 8, Moscow, B. Demidovsky pereulok, 17; Anatoly S. Khomyak, korpus 320, kv. 68, Moscow, 103482; Lev I. Schukin, korpus 921, kv. 203, Moscow, 103482, and Marat S. Chukin, korpus 418, kv. 113, Moscow, 103498, all of U.S.S.R.

Filed Mar. 25, 1980, Ser. No. 133,930

Int. Cl.[3] H01J *17/04, 61/04*

U.S. Cl. 313—209 1 Claim



1. A hollow-cathode gas-discharge tube comprising:

an envelope filled with an inert gas and provided with a window designed to pass line spectrum emission of chemical elements;

an anode of said tube contained within said envelope;

a cathode of said tube contained within said envelope and isolated from said anode, said cathode being provided with a cylindrical cavity having a diameter d, which is open on the side of said anode, and an end surface disposed on said side;

said anode of said tube representing a hollow body of revolution open on both ends and arranged within said envelope coaxially with said cylindrical cavity of said cathode, said body being composed of a hollow cylindrical portion mating a hollow variable-section portion;

said hollow cylindrical portion of said anode arranged in the vicinity of said end surface of said cathode and representing a hollow cylindrical structure with a cavity diameter D and a bottom provided with a central opening and disposed level with or below said end surface of said cathode;

said hollow variable-section portion of said anode containing a cavity whose diameter evenly increases in the direction of emission from said diameter D of said preceding cylindrical portion of said anode, a height 1 of said cylindrical portion of said anode, said diameter D of its cavity, and said diameter d of said cylindrical cavity of said cathode being related to one another as follows:

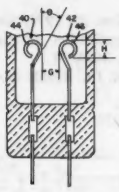
$$3d \leq 1 \leq 6d$$

$$2 \leq D/d \leq 4.$$

4,320,322
ELECTRODE GEOMETRY TO IMPROVE ARC STABILITY

Harold L. Rothwell, Jr., Rowley; William M. Keeffe, Rockport, and W. Calvin Gungle, Danvers, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 24, 1980, Ser. No. 132,930
Int. Cl.³ H01J 61/04, 61/30
U.S. Cl. 313—217 3 Claims

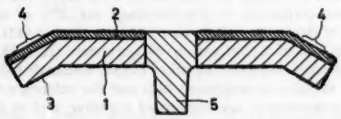


1. A high intensity arc discharge device having a transparent body including an arc chamber containing an arc generating and sustaining medium and a pair of electrodes sealed in said body and extending into said arc chamber, said electrodes having major portions and minor portions, said major portions of said electrodes being substantially parallel with respect to each other and said minor portions being formed as substantially circular loops at least partially convergent toward each other, a stable arc region existing primarily between said convergent portions of said loops.

4,320,323
METHOD OF IMPROVING THE HEAT RADIATION PROPERTIES OF AN X-RAY TUBE ROTARY ANODE AND A ROTARY ANODE THUS OBTAINED

Frederik Magendans; Gerhardus A. Te Raa, and Bernhard J. van Rheenen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,964
Claims priority, application Netherlands, May 1, 1979, 7903389
Int. Cl.³ H01J 35/08, 35/10
U.S. Cl. 313—330 6 Claims



1. A method for improving the heat radiation properties of a rotary anode having a supporting body consisting of a molybdenum alloy and a target consisting of a tungsten alloy, a portion only of said target being adapted for use as a focal path, wherein a heat radiation improving layer is applied to the surface of the anode, characterized by

roughening substantially the whole surface, except the focal path, of the rotary anode by blasting with steel grit,

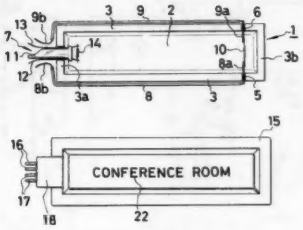
then removing any steel grit particles embedded in the anode by means of an acid, and

then coating substantially the whole surface of the anode, except the target, with a rough tungsten layer by flame spraying.

4,320,324
FLAT FLUORESCENT LAMP

Kazuo Ariga, Tokyo, and Mitunari Yoshida, Yokohama, both of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1979, Ser. No. 107,356
Claims priority, application Japan, Dec. 30, 1978, 53-182657[U]
Int. Cl.³ H01J 61/30, 61/42
U.S. Cl. 313—493 8 Claims



1. In combination, a flat type fluorescent lamp and a frame therefor, comprising:

a pair of generally rectangular, dish-shaped halves (1) each having a projecting flat surface portion (2) and a peripheral flange portion (3) surrounding said projecting portion (2), said dish-shaped halves (1) facing each other and being connected together at said peripheral flange portions thereof to form a generally rectangular hollow body have two opposed short ends and two opposed longer sides;

a stem (7) disposed at only one of said short ends of the connected rectangular hollow body, said stem (7) containing an exhaust pipe (11) and voltage supply terminals (12,13);

a first discharge electrode (14) coupled to said voltage supply terminals (12,13) and being in said rectangular hollow body at said one short end thereof;

a second discharge electrode (10) mounted in said hollow body at the opposite short end of said rectangular hollow body;

a base (18) having two pairs of pin electrodes (16,17), said base being located only at said one short end of said rectangular hollow body in the vicinity of the stem (7);

a pair of lead wires (8,9) connected at one end to said second discharge electrode (10), said lead wires (8,9) extending from said second discharge electrode (10) to said base (18), said lead wires (8,9) extending outside of said rectangular hollow body and along and adjacent to the outside marginal area of said flange portions (3) of the dish-shaped halves (1) over at least a major portion of length of said longer sides of said rectangular hollow body and over a portion of said one short end of said rectangular hollow body;

the other ends of said lead wires (8,9) and said voltage supply terminals (12,13) being connected to respective ones of said pin electrodes of said base (18); and

a generally rectangular frame (15) surrounding substantially the complete periphery of said rectangular hollow body, said frame (15) having a groove (19) formed on the inner surface thereof for receiving and engaging said flanges (3) therein, the portion of said lead wires (8,9) which extend along said flange portions being received in said groove (19) of said frame (15).

4,320,325

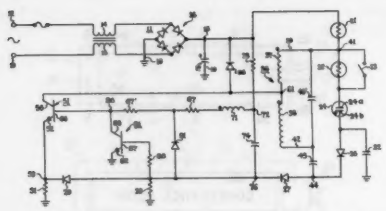
CIRCUIT FOR STARTING AND BALLASTING ARC DISCHARGE LAMPS

Thomas E. Anderson, South Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 29,322, Apr. 12, 1979, abandoned. This application Feb. 19, 1980, Ser. No. 122,399

Int. Cl.³ H05B *37/00, 39/00, 41/14*

U.S. Cl. 315—205 9 Claims



1. A circuit for starting and operating a gas-filled, high-pressure high-intensity type of arc lamp from an electric power source, comprising an oscillatory starting circuit connected to be powered by said power source and including a transformer having an output winding for providing pulsating voltage of given frequency, means for applying to said arc lamp a starting voltage derived from said output winding for a time period until an arc is established in said lamp, means to inactivate said oscillatory circuit when said arc is established, and means connected for ballasting said arc lamp for operation from said electric power source, said first-named means including a capacitor in series with said output winding for electrically isolating the output winding from said power source, said capacitor having a value of capacitance sufficiently large with respect to said frequency of the pulsating voltage so as to be conductive thereof, said circuit further including a diode connected in series with said capacitor to form therewith a voltage doubler circuit for said pulsating voltage, and in which said capacitor functions as a component in the voltage doubler circuit in addition to its said function of isolating the output winding from the power source for the arc lamp.

3. A circuit for starting and operating a gas-filled, high-pressure high-intensity type of arc lamp from an electric power source, comprising an oscillatory starting circuit connected to be powered by said power source and including a transformer having an output winding for providing pulsating voltage of given frequency, means for applying to said arc lamp a starting voltage derived from said output winding for a time period until an arc is established in said lamp, means to inactivate said oscillatory circuit when said arc is established, and means connected for ballasting said arc lamp for operation from said electric power source, said first-named means including a capacitor in series with said output winding for electrically isolating the output winding from said power source, said capacitor having a value of capacitance sufficiently large with respect to said frequency of the pulsating voltage so as to be conductive thereof, said circuit including a current sensing device connected in series with said operating current path of the arc lamp, and in which said oscillatory starting circuit includes a switch device having a control electrode, and control means connected between said current sensing device and said control electrode for biasing said switch device in the "off" condition and hence turning off said oscillatory starting circuit in response to a predetermined value of arc lamp operating current being reached.

4,320,326

ELECTRONIC DEVICE FOR CONTROLLING THE BRIGHTNESS OF AN ELECTRIC GAS DISCHARGE LAMP WITHOUT AN INCANDESCENT CATHODE

Walter Banziger, Wolfhalden, and Hanspeter Coufal, Eggersriet, both of Switzerland, assignors to Elstrom Electronic AG, Wolfhalden, Switzerland

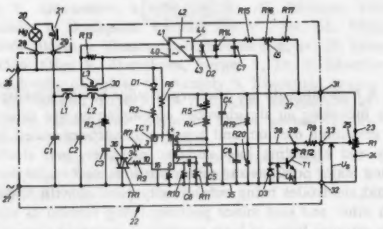
PCT No. PCT/CH79/00012, § 371 Date Oct. 11, 1979, § 102(e) Date Oct. 11, 1979, PCT Pub. No. WO79/00615, PCT Pub. Date Sep. 6, 1979

PCT Filed Jan. 29, 1979, Ser. No. 189,923

Claims priority, application Switzerland, Feb. 11, 1978, 1488/78; Apr. 6, 1978, 3679/78

Int. Cl.³ H05B *41/392*

U.S. Cl. 315—307 13 Claims



1. An electronic device for controlling the brightness of an electrical gas-discharge lamp, having no incandescent cathode, from an alternating-current network, by means of a circuit arrangement for controlling the electrical energy fed to the lamp by a triac arranged in the lamp supply circuit, the ignition angle of the said triac being adjustable, within each alternating-voltage half-wave, as a function of a d.c. control voltage, an additional circuit arrangement being provided for the production of a regulating voltage dependent upon the intensity of the current flowing through the gas-discharge lamp, for the purpose of ensuring automatically a given minimal current intensity flowing through the said lamp, regardless of the value of the said d.c. control voltage, the said additional circuit arrangement comprising a rectifier arrangement and a current transformer, of which the primary winding lies in the supply circuit to the gas-discharge lamp, while the secondary winding thereof is connected to the input of the said rectifier arrangement, the said regulating voltage being derived from the output of the said rectifier arrangement, characterized in that the additional circuit arrangement (30, 42, R12–R17, C7, D3, T1; R21, R22, D4, T2) comprises a reference-voltage source (IC1, 35, 37) and a voltage divider (R15, R16, R17), the ends of which are connected to the terminals (44, 37), of opposite polarity of the output of the rectifier arrangement (42), on the one hand, and of the reference-voltage source (IC1, 35, 37) on the other hand, whereas the other output terminals (43, 35) of the said rectifier arrangement (42) and the reference-voltage source, respectively, are connected together; and in that the regulating voltage (U_R; U_{R1}, U_{R2}) is taken from a tap (45; 47) of the said voltage divider (R15, R16, R17; R21, R22).

4,320,327

AUTOMOTIVE RIM ROLL FORMING DRIVE SYSTEM

Vernon R. Fencl, Northbrook, Ill., assignor to Grotnes Metalforming Systems, Inc., Chicago, Ill.

Filed Mar. 27, 1980, Ser. No. 129,725

Claims priority, application Japan, Apr. 6, 1979, 54-42349

Int. Cl.³ B21B *37/00*

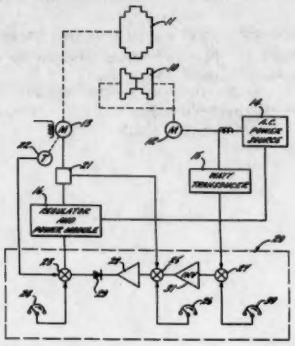
U.S. Cl. 318—50 6 Claims

1. An electric drive system for an automotive wheel rim forming system having inner and outer forming rolls mounted on driven spindles, said drive system comprising

drive means for separately driving the inner and outer spin-

dles, at least one of said drive means comprising an a-c. motor,

means for maintaining a predetermined speed ratio between the drive means for said inner and outer spindles in the absence of a working load thereon, and



means for generating a torque reference signal in response to the power inpiut to said a-c. motor for varying the power delivered by the other of said drive means to its spindle so as to maintain a predetermined torque ratio between the outputs of said drive means during variations in the loads on said forming rolls during the forming of a wheel rim by said rolls.

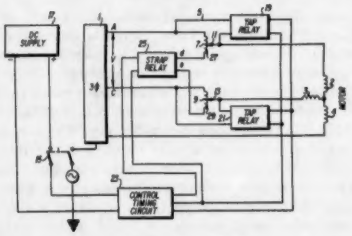
4,320,328
APPARATUS FOR FULL VOLTAGE START OF VIBRATORY EXCITORS

Kenneth E. Rudolph, Jr., Louisville, Ky., assignor to Vibranetics, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 19,215, Mar. 9, 1979. This application Aug. 3, 1979, Ser. No. 63,498

Int. Cl.³ H02P *1/26*

U.S. Cl. 318—431 **13 Claims**



1. Motor operating apparatus for starting an electric motor having a plurality of interconnected primary windings at full line voltage and for operating said motor at running speed at a reduced line voltage, comprising:

autotransformer means having at least two coils and a strap means for connecting the at least two coils in series;

source means for applying a particular line voltage to input ends of the coils of said autotransformer means;

tap means for adjustably contacting each of said coils to receive a corresponding voltage which is reduced as compared with said line voltage and connected to apply the reduced voltage of each coil to at least one associated primary winding of the motor; and

tap switching means for shorting out the part of each of said coils between said source means and said tap means to connect said tap means to receive said full line input voltage to start the motor and for disconnecting said tap means from said line input voltage after starting to allow said tap means to supply said associated primary windings with the reduced voltages to operate said motor at running speed.

4,320,329
WINDSHIELD WIPER CONTROL CIRCUIT

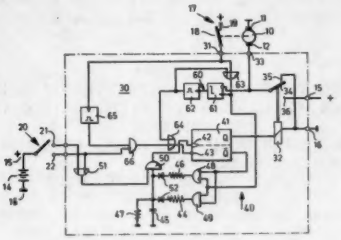
Gunther Gille, Sersheim; Horst Goertler, Sachsenheim, and Hans Prohaska, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed May 5, 1980, Ser. No. 146,299

Claims priority, application Fed. Rep. of Germany, May 9, 1979, 2918658

Int. Cl.³ H02P *1/04*

U.S. Cl. 318—443 **5 Claims**



1. A control circuit for the windshield wiper system of a motor vehicle and of the type which comprises an electric motor being operable over wiping cycles and means including an operating switch for controlling said motor between continuous and intermittent modes of operation and wherein a voltage source is applied to the motor by way of a switching element which during the intermittent mode of operation is controlled by a pulse generator which is coupled to said switching element by said operating switch, said control circuit comprising: means for detecting the speed of said motor, switching means coupled to said switching element and responsive to the detecting means for controlling said motor into said intermittent mode of operation when the detected speed of said motor is less than a predetermined value, and timing means coupled to said pulse generator and responsive to said switching means for increasing the duration between successive ones of the pulses generated by said pulse generator when the detected speed of said motor is less than said predetermined value.

4,320,330
APPARATUS AND METHOD FOR DETERMINING STEP MOTOR DRIVE PULSE TIMING BY ROTOR DISPLACEMENT

Dietrich J. Bahr, and Karl-Heinz Burckardt, both of Herrenberg, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,430

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1979, 2935800

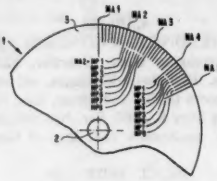
Int. Cl.³ G05B *19/40*

U.S. Cl. 318—685 **8 Claims**

1. Apparatus for controlling the profile of relative velocity between the rotor and stator of a stepping motor by producing motor advance pulses at times dependent upon the relative displacement of said rotor and stator comprising:

disk means mounted for rotation with said rotor bearing sensible first indicia arranged equiangularly on said disk and a plurality of sensible second indicia arranged equiangularly between each pair of said first indicia on said disk; and

counter means operable to produce said motor advance signals, said counter means being settable with values corresponding to increments of rotor displacement at



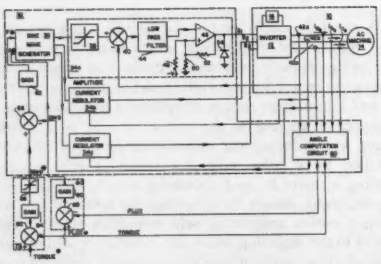
which each motor advance signal is to be supplied and being incrementally advanced to said displacement values by pulses representing said first and second indicia.

4,320,331

TRANSISTORIZED CURRENT CONTROLLED PULSE WIDTH MODULATED INVERTER MACHINE DRIVE SYSTEM

Allan B. Plunkett, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,479
Int. Cl.[3] H02P *7/58*
U.S. Cl. 318—722 **15 Claims**



1. An alternating current machine drive system comprising:

a multiphase alternating current machine;

an inverter coupled to said multiphase machine for supplying said machine with alternating current, each phase component of alternating current supplied by said inverter to said multiphase machine varying in frequency and amplitude in accordance with a respective phase of inverter switching signals; and

control means coupled to said inverter and said multiphase alternating current machine for supplying said inverter with inverter switching signals for each phase of said inverter, said control means including

means for generating a current amplitude command;

means for generating a machine phase angle command;

reference signal generating means for supplying a multiphase reference signal which varies in frequency and amplitude in accordance with said machine phase angle command and said current amplitude command, respectively; and

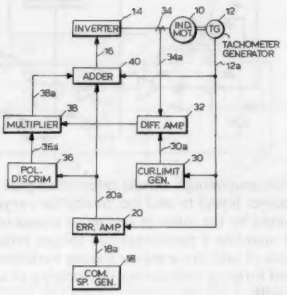
a plurality of current regulator means corresponding in number to the number of phases of said multiphase alternating current machine, each of said plurality of current regulator means coupled to said multiphase alternating current machine and to said reference signal generating means, each regulator means providing a current error signal proportional to the difference in magnitude between a respective phase component of actual inverter current and a respective phase component of said multiphase reference signal and supplying inverter switching signals to one phase of said inverter in accordance with the deviation in magnitude of said current error signal from said respective phase component of actual inverter current.

4,320,332

SPEED CONTROL SYSTEM FOR INDUCTION MOTOR

Hidehiko Sugimoto, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1980, Ser. No. 169,487
Claims priority, application Japan, Jul. 17, 1979, 54-90495
Int. Cl.[3] H02P *5/40*
U.S. Cl. 318—798 **3 Claims**



1. A system for controlling a rotational speed of an induction motor, comprising an induction motor, a speed sensor connected to said induction motor to sense the actual rotational speed of said induction motor to generate an actual speed signal, a command speed generator for generating a command speed signal for the induction motor, means for producing an error signal corresponding to the difference between said actual speed signal and said command speed signal and for adding said error signal to said actual speed signal to form a command frequency signal, and an inverter responsive to said command frequency signal to deliver a voltage at a frequency corresponding to said command frequency signal to said induction motor to control the latter; wherein there are provided first means for sensing an electrical quantity relating to a torque or an output from said induction motor and for delivering a signal representing a difference between said sensed electrical quantity and a predetermined limit of the electrical quantity when said sensed electrical quantity exceeding said predetermined limit, and second means for multiplying said difference signal from said first means by a signal having the polarity determined by that of said error signal to form a product signal, and for adding said product signal to the sum of said actual and error speed signals.

4,320,333

BATTERY CHARGER AND SURVEILLANCE SYSTEM

Alfred M. Hase, 6 Manorwood Rd., Scarborough, Ontario, Canada

Filed Sep. 19, 1979, Ser. No. 77,030
Int. Cl.[3] H02J *7/04*; H01M *10/44*
U.S. Cl. 320—43 **4 Claims**

1. Storage battery charging apparatus which is adapted at its input for connection to a source of electrical energy, and at its output to the terminals of a storage battery; where said apparatus includes controllable synchronous switch means adapted to control the rate of electrical energy input to a battery to which said apparatus is connected; said apparatus having a multirate charging current output program, including a controlled and tapered transition from a high to a low charging rate, and a continuous, constant current trickle charging rate at the end of

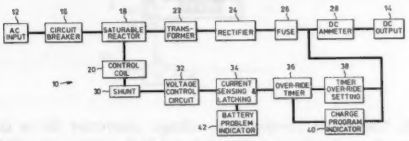
the program until said battery is disconnected or the charging program is otherwise terminated; and where:

(a) said apparatus further includes control circuit means (32) to drive said controllable synchronous switch means so as to reduce the rate of electrical energy input to said battery by controlling the operating period of said synchronous switch until such time that the controlled operation period of said synchronous switch reduces to a predetermined minimum period, or until expiration of a predetermined amount of time from the beginning of said multirate charging current output program as determined by an override timer circuit (36), whose operation is initiated at the beginning of said multirate charging current output program: and

(b) said apparatus further includes circuits for monitoring and providing a real time, full time, surveillance of said control circuit operation, including

(i) a timer override setting circuit means (38) to set a predetermined length of time for said multirate charging current output program;

(ii) a charge program indicator circuit (40) having a lamp



which continuously gives a visual signal of the continuing operation of said multirate charging current output program during said predetermined length of time;

(iii) a current sensing and latching circuit (34) having means which continuously monitors the operation of said control circuit by sensing the operating current thereof, and comparing said sensed operating current with a reference signal indicative of the anticipated operating current at each instant of time during said charging program, or after the termination thereof; said current sensing and latching circuit further including a latch means adapted to close, and to remain closed until unlatched, when an operating current condition is sensed which is not equivalent to said reference signal at that particular instant of time; and

(iv) alarm annunicator circuit including a battery problem indicator circuit (42) associated with the said latch means of said current sensing and latching circuit and adapted to be triggered thereby if the sensed operating current differs from the anticipated operating current; and a lamp for giving a visual signal when said battery problem indicator circuit is triggered.

4,320,334

BATTERY STATE-OF-CHARGE INDICATOR

Richard K. Davis, Charlottesville, and Charles E. Konrad, Roanoke, both of Va., assignors to General Electric Company, Salem, Va.

Filed Oct. 1, 1980, Ser. No. 192,882
Int. Cl.³ H02J 7/00; G08B 21/00
U.S. Cl. 320—48 **10 Claims**

1. A method for providing a representation of the state-of-charge of a battery comprising the steps of:

(a) sensing the value of terminal voltage of the battery;

(b) storing a value representative of the open circuit terminal voltage of the battery; and,

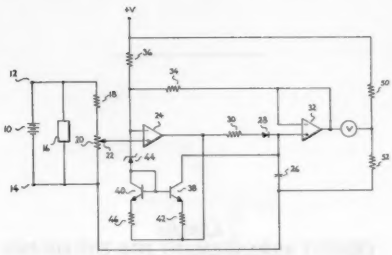
(c) decreasing the stored value representative of open circuit battery terminal voltage at a first rate which is proportional to the difference between the stored value and the sensed value of battery terminal voltage when the sensed value is less than the stored value.

4. Apparatus for providing a representation of the state-of-charge of a battery comprising:

(a) means connected for sensing the magnitude of terminal voltage of the battery and for developing a first signal representative thereof;

(b) means connected for receiving and storing said first signal;

(c) means for comparing said stored first signal to subsequently developed ones of said first signals and for generating a second signal representative of the difference therebetween;



(d) means for reducing the value of said stored first signal at a first rate proportional to said second signal when said stored first signal is representative of a greater battery voltage magnitude than that represented by said subsequently developed first signals; and,

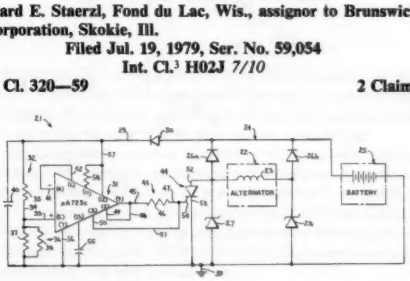
(e) means for increasing the value of said stored first signal at a second rate proportional to said second signal when said subsequently developed first signals are representative to a battery voltage magnitude greater than that represented by said stored first signal.

4,320,335

ENERGY REGULATING SYSTEM

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jul. 19, 1979, Ser. No. 59,054
Int. Cl.³ H02J 7/10
U.S. Cl. 320—59 **2 Claims**



1. An energy regulating system wherein a battery is electrically connected to an electrical energy generating winding of a generator through a connecting circuit with a switch connected to the connecting circuit for operation between a first condition to supply electrical energy from the winding to the battery and a second condition to operatively interrupt the flow of electrical energy from the winding to the battery, wherein the improvement comprises a comparator including a current limit circuit and a reference circuit providing a substantially constant reference signal substantially independent of temperature variations and independent of the charge of said battery, said comparator having a first input connected to said battery through a sensing circuit to continually receive a signal directly proportional to said battery charge and a second input connected to said reference circuit to receive said independent reference signal and providing an output circuit operatively

connected to said switch to transfer from the first condition to the second condition to interrupt the energy flow to the battery when the charge indicative signal exceeds a predetermined magnitude established in response to the reference signal, and including a current limiting feed back circuit connected to said output circuit and to said current limit circuit to limit the magnitude of current supplied to said switch.

4,320,336

CIRCUIT ARRANGEMENT FOR THE ON-OFF SWITCHING OF A LINE VOLTAGE TO AND FROM A LOAD

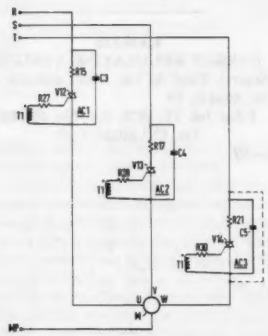
Josef Immler, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 13,117, Feb. 21, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 234,996

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1978, 2807400

Int. Cl.³ G05F *1/455*

U.S. Cl. 323—324 **3 Claims**



1. In a circuit arrangement for the on and off switching of a line voltage to a line load in which an oscillator produces cyclic opposite polarity high-frequency rectangular pulses which are fed, via a gate circuit, to the primary winding of a transformer which includes a secondary winding connected to a gate control circuit of a triac, the triac being connected to the line voltage, the improvement therein comprising:

a switch connected between the gate circuit and the primary winding of the transformer, said switch connected in series with the primary winding and operable to close in response to one polarity pulse during a cycle; and

a resistor connected in series with the secondary winding and the control gate circuit of the triac, said resistor and the secondary winding dimensioned to maintain conduction of the triac through the other polarity pulse during this cycle.

4,320,337

COMBINED CURRENT AND VOLTAGE CONVERTER FOR A COMPRESSED-GAS INSULATED METAL-ENCLOSED HIGH VOLTAGE INSTALLATION

Hans Hartmann, Zurich, and Gerhard Mauthe, Birmenstorf, both of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

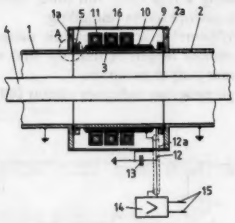
PCT No. PCT/CH79/00005, § 371 Date Nov. 9, 1979, § 102(e) Date Sep. 6, 1979, PCT Pub. No. WO79/00729, PCT Pub. Date Oct. 4, 1979

PCT Filed Jan. 23, 1979, Ser. No. 165,482

Claims priority, application Switzerland, Mar. 9, 1978, 2554/78

Int. Cl.³ H01F *40/08*

U.S. Cl. 323—358 **8 Claims**



1. Combined current and voltage converter for a compressed-gas insulated metal-enclosed high voltage installation in which the measuring voltage is obtained by means of capacitive voltage division and the measuring current is obtained by means of at least one toroid core with winding, arranged outside of the housing, characterised in that the housing (1, 2) contains a metallic intermediate element (3) inserted in an insulated manner, the outside of which is provided with a layer of insulating material (9), and that the outside of the latter (9) is provided with a metal layer (10), and that the whole (3, 9, 10) forms a support body for the toroid core(s) (11).

4,320,338

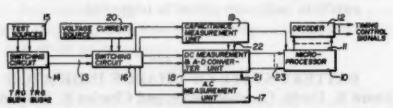
METHODS OF AND APPARATUS FOR DETERMINING THE CAPACITANCE OF A TRANSMISSION LINE BY INTEGRATING LINE CURRENTS

Darryl C. Morris; Normand A. Saucier, both of Concord, and Lot Phillips, Brookline, all of N.H., assignors to Northern Telecom, Inc., Nashville, Tenn.

Filed Jan. 8, 1980, Ser. No. 110,478

Int. Cl.³ G01R *27/26, 31/08*

U.S. Cl. 324—60 C **25 Claims**



1. Apparatus for determining the capacitance of a transmission line, comprising;

a plurality of integrators having different integration time constants;

means for charging the line to a predetermined voltage, and for discharging the line and integrating the discharge current simultaneously in the plurality of integrators;

comparison means, associated with at least each integrator except that having the largest integration time constant, for producing a signal if an output voltage of the respective integrator exceeds a predetermined level; and

sampling means for sampling the output voltage of that one of the integrators which has the smallest integration time

constant and in respect of which no said signal is produced within a predetermined period commencing with the start of the discharge, said signal(s) and the sampled output voltage constituting a measure of said capacitance.

17. A method of determining the capacitance of a transmission line comprising the steps of:

charging the line to a predetermined voltage;

discharging the line and integrating the discharge current simultaneously in a plurality of integrators having different integration time constants;

comparing an output voltage of at least each integrator except that having the largest integration time constant with a predetermined level and producing a signal if the output voltage of the respective integrator exceeds the predetermined level; and

sampling the output voltage of that one of the integrators which has the smallest integration time constant and in respect of which no said signal is produced within a predetermined period commencing with the start of the discharge, to produce a measure of said capacitance.

4,320,339

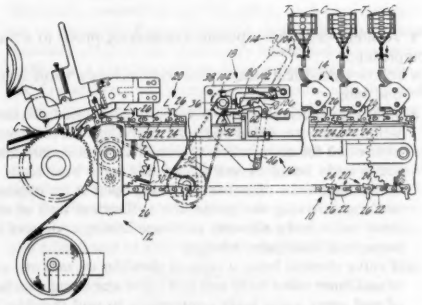
COMPONENT TESTING STATION

Stanley R. Vancelette, Manchester, N.H., assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 848,900, Nov. 7, 1977, abandoned. This application May 3, 1979, Ser. No. 35,929

Int. Cl.³ G01R *31/00*; B07C *5/08*

U.S. Cl. 324—73 AT **11 Claims**



1. A machine for processing electronic components of a kind having portion of their leads extending from their bodies along a common axis, said machine comprising: means for advancing the components along a path; a pair of electrical contact sets lying in said path and spaced apart from one another so that each set engages one of the component leads, each set including at least two lead-engaging members, at least one of which is yieldably mounted and arranged relative to the other member to be displaced by an advancing lead so as to retard said lead, means for connecting the contact sets in electrical circuitry for determining acceptability of individual components according to predetermined electrical requirements and interrupting operation of the machine if a component is not acceptable, and means for releasing the component through the machine if it is acceptable.

4,320,340

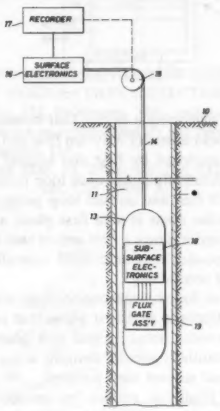
APPARATUS FOR MEASURING MAGNETIC FLUX DENSITY RESULTING FROM GALVANIC CURRENT FLOW IN SUBSURFACE CASING USING A PLURALITY OF FLUX GATES

Heinz D. Lichtenberg, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 13, 1979, Ser. No. 74,834

Int. Cl.³ G01N *27/72*; G01R *33/04*

U.S. Cl. 324—221 **3 Claims**



1. Apparatus for locating corrosion on ferromagnetic casing vertically traversing subsurface earth formations by measuring the magnetic flux density resulting from the longitudinal flow of d.c. galvanic current within said casing; comprising:

an elongated body member adapted to traverse said casing;

a plurality of flux gates positioned within said body member and aligned with the axis of sensitivity of each of said flux gates at a right angle to said longitudinal galvanic current flow for detecting the magnetic flux density resulting from said galvanic current flow, each of said flux gates comprising a drive coil and a sense coil;

a plurality of sample and hold circuits, each of said sample and hold circuits connected to a sense coil for providing a plurality of d.c. signals functionally related to the detected magnetic flux density;

an oscillator circuit switchably connected to said drive coils and connected to said sample and hold circuits for providing a drive signal to said drive coils and a synchronization signal to said sample and hold circuits;

a plurality of filter circuits, each filter circuit connected to a sample and hold circuit; and

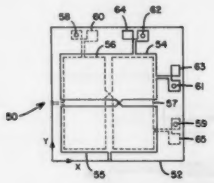
a summing amplifier connected to said plurality of filter circuits providing an output voltage signal functionally related to the composite of the d.c. signals, said composite voltage signal representing the magnetic flux density resulting from said galvanic current flow; and means for transmitting said composite voltage signal to a surface location.

4,320,341

METHOD AND APPARATUS FOR BALANCING THE MAGNETIC FIELD DETECTING LOOPS OF A CRYOGENIC GRADIOMETER USING TRIMMING COILS AND SUPERCONDUCTING DISKS

Charles L. Lutes, Farmington, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Jan. 17, 1980, Ser. No. 112,897
Int. Cl.[3] G01R *33/02*
U.S. Cl. 324—248 27 Claims



1. A method of balancing a device that measures the difference in magnetic field intensity between first and second points in space that are enclosed by first and second, respectively, superconducting, relatively large, open loop patterns that lie in a first plane, which first and second loop patterns encompass approximately similar areas in said first plane and which are interconnected in series along a first axis in said first plane but which are of opposite, magnetic field cancelling, winding sense, said method comprising:

forming third and fourth superconducting, relatively small, open loop patterns in said first plane that encompass approximately similar areas in said first plane, but which areas are substantially smaller than the areas encompassed by said first and second loop patterns;

forming a first trimming pattern by interconnecting said third and fourth loop patterns in series but of opposite, magnetic field cancelling, winding sense;

interconnecting said interconnected third and fourth loop patterns external to and in series with only one of said first or second loop patterns and along said first axis; and

placing a superconducting first disk in said first plane and within said third or fourth loop pattern but not both.

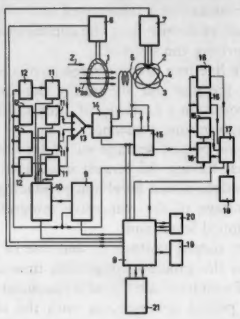
4,320,342

MAGNET COIL ARRANGEMENT FOR GENERATING LINEAR MAGNETIC GRADIENT FIELDS

Jürgen Heinzerling, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 14, 1979, Ser. No. 75,474
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840178
Int. Cl.[3] G01N *27/00*
U.S. Cl. 324—319 4 Claims

1. In apparatus for generating linear magnetic gradient fields which comprises at least one group of four identical rectangular coils which are disposed in symmetric pairs around an axis (26), each coil including two lengthwise coil sections (25) which are parallel to the axis, all of the lengthwise sections being disposed at the same radial distance (R) from the axis; the improvement wherein the length (L) of the lengthwise sections is approximately 2.9 times the radial distance and the angle (θ)



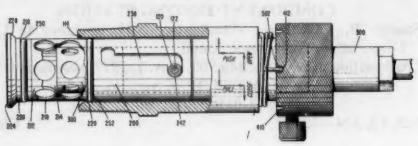
subtended at the axis by adjacent lengthwise segments of neighboring coils is approximately 30.3°.

4,320,343

SAFETY VALVE FOR EXPOSING A MEASURING PROBE TO A FLUID

Maxwell Ingram, Hackensack, N.J., assignor to Marine Electric Corporation, Brooklyn, N.Y.

Filed Oct. 1, 1979, Ser. No. 81,030
Int. Cl.[3] G01N *27/28*
U.S. Cl. 324—450 19 Claims



1. A safety valve for exposing a measuring probe to a fluid, comprising:

a hollow cylindrical outer valve body having a valve seat at one end;

a hollow cylindrical inner valve body positioned coaxially within said outer valve body and carrying a valve element at one end for cooperation with said valve seat, said inner valve body being closed at one end by a base so as to define an interior chamber and being open at the opposite end for receiving the probe, the cylindrical wall of said inner valve body adjacent said base having apertures for passage of fluid therethrough;

said valve element being a tapered shoulder on said one end of said inner valve body and said valve seat being a surface of said outer valve body conforming to said shoulder of said valve element to assure fluid tight engagement therebetween in response to pressure exerted by the fluid on said base of said inner valve body;

said inner valve body being movable within said outer valve body between open and closed valve positions, said inner valve body extending at least partially from said outer valve body in said open valve position for permitting passage of fluid through said apertures into said chamber for exposing the probe to the fluid, and said valve seat engaging said valve element in said closed valve position for blocking the passage of fluid into said chamber;

means for securing the probe in said inner valve body, said probe securing means being movable in a first direction for securing the probe and a second direction for releasing the probe; and

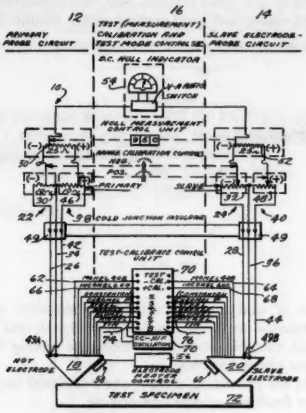
means for closing the valve in response to movement of said

probe securing means in said second direction so that said inner valve body moves to said closed position prior to removal of the probe.

4,320,344
METAL-ALLOY THERMOELECTRIC CHARACTERISTIC ANALYZER

William R. Nicholas, 115 Linda La. Apt. #2, Palm Beach Shores, Singer Island, Fla. 33404

Continuation-in-part of Ser. No. 927,736, Jul. 24, 1978, abandoned. This application Oct. 1, 1979, Ser. No. 80,224
Int. Cl.³ G01N *25/18*
U.S. Cl. 324—451 **26 Claims**



1. Apparatus for providing indicia of the metal alloy composition of a test piece comprising:

first and second thermoelectric probes adapted for thermoelectrically contacting said test piece, each probe including an electrode, first and second thermoelectric circuits thermally coupled and electrically connected to said electrode, and a variable voltage divider electrically coupling said first and second thermoelectric circuits, said first and second thermoelectric circuits having different predetermined thermoelectric characteristics;

said apparatus further comprising means for adjusting the variable voltage divider of said first and second probes together in synchronism; and

means for electrically coupling said variable voltage dividers in series opposition and for providing indicia of the relative adjustment of said variable voltage dividers.

4,320,345
ADAPTIVE DIFFERENTIAL PSK DEMODULATOR

William N. Waggener, Sarasota, Fla., assignor to Sangamo Weston, Inc., Norcross, Ga.

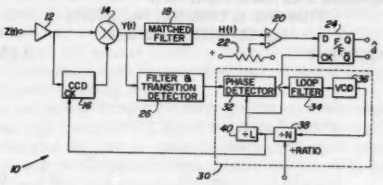
Filed Apr. 28, 1980, Ser. No. 144,752
Int. Cl.³ H03D *3/18*
U.S. Cl. 329—50 **36 Claims**

1. Apparatus for demodulating a modulated signal, comprising:

means, coupled to said modulated signal, for delaying said modulated signal;

means, responsive to said modulated signal and to said delayed signal, for multiplying said modulated and delayed signal together to produce at least one demodulated output signal; and

means, responsive to said output signal, for detecting a parameter related to the symbol rate of said modulated signal and for adaptively varying the amount of delay

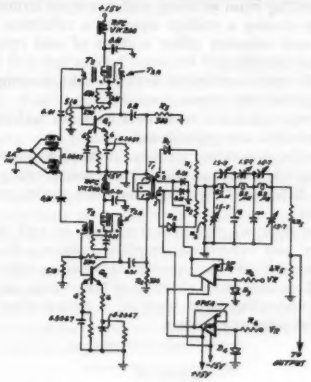


interposed by said delay means in accordance with said detected parameter of said modulated signal.

4,320,346
LARGE DYNAMIC RANGE LOW DISTORTION AMPLITUDE MODULATION DETECTOR APPARATUS

Daniel J. Healey, III, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 21, 1980, Ser. No. 132,452
Int. Cl.³ H03D *1/10*
U.S. Cl. 329—101 **4 Claims**



1. An amplitude modulation detector apparatus comprising in combination:

a power amplifier means to receive carrier frequency signals, said carrier frequency signals being amplitude modulated,

an envelope detection means connected to said power amplifier means to receive said carrier frequency signals, said envelope detection means detecting said amplitude modulation, said envelope detection means having a recovery time rate of less than 2.1 nanoseconds, said envelope detection means providing an IF envelope signal,

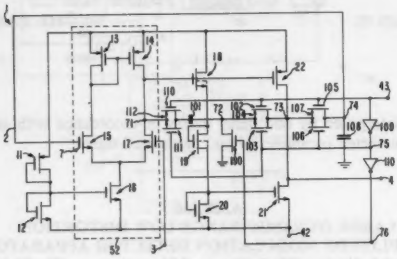
a forward biasing supply means connected to said envelope detection means to provide a trickle current thereto, said trickle current providing temperature compensation for said envelope detection means, said trickle current being substantially independent of temperature variation, and,

a low pass filter means connected to said envelope detection means to receive said IF envelope signal, said low pass filter means filters said IF envelope signal to suppress unwanted frequency components, said low pass filter means providing a constant group delay to IF frequencies beyond the 3 db cutoff point, said low pass filter means providing Chebyshev behavior with attenuation peaks at the IF frequency and its harmonics.

4,320,347
SWITCHED CAPACITOR COMPARATOR

Yusuf A. Haque, San Jose, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed Oct. 1, 1980, Ser. No. 192,721
Int. Cl.³ H03F 1/02, 3/45
U.S. Cl. 330—9 **2 Claims**



1. A voltage comparator circuit comprising:

an operational amplifier having an inherent offset voltage, said amplifier containing an inverting current mirror differential input leg having an inverting input terminal, a noninverting current mirror differential input leg having a noninverting input terminal, and an output terminal;

means for storing a voltage equal to a reference voltage minus said inherent offset voltage of said operational amplifier including;

(a) switch means connected between said inverting input terminal and said output terminal;

(b) a storage capacitor connected between said inverting input terminal and ground; and

(c) means for preventing positive feedback by capacitively coupling said output terminal to said noninverting current mirror differential input leg only when storing said voltage; and

means for applying said stored voltage to said inverting input of said operational amplifier, wherein the output signal available on said operational amplifier output terminal will be indicative of whether the voltage applied to said noninverting input terminal is greater than or less than said reference voltage.

4,320,348
VARIABLE LEVEL CONVERTER

Shinjiro Suzuki; Tadashi Yoshikawa; Tsuguo Otsuki, all of Yokohama; Masao Takeda, Hachioji; Nobuhisa Kamoi, Yokohama, and Kazuo Satoh, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 29, 1979, Ser. No. 70,608
Claims priority, application Japan, Aug. 29, 1978, 53-105137
Int. Cl.³ H03G 3/30
U.S. Cl. 330—52 **2 Claims**

1. A variable level converter, for converting an input signal of a first level to an output signal of a second level, comprising:

means for providing a level control signal,

a first variable level converting unit, operatively connected to said means for providing a level control signal, for receiving the input signal;

a circuit stage, operatively connected to said first variable level converting unit and said means for providing a level control signal, for producing the output signal, said circuit stage comprising a single amplifying transistor operatively connected to said first variable level converting unit and a second variable level converting unit, having an output operatively connected to said amplifying transistor, for producing the output signal at said output, said first and second variable level converting units having the same transfer function;

said first variable level converting unit comprising:

a first resistor operatively connected to receive the input signal and operatively connected to said amplifying transistor; and

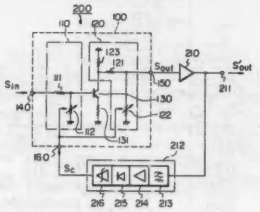
a first variable impedance element, operatively connected to said first resistor, said amplifying transistor and said means for providing said level control signal, so that the impedance of said first vriable impedance element is varied in dependence upon said said level control signal;

said second variable level converting unit comprising:

a second resistor operatively connected to said amplifying transistor;

a third resistor operatively connected to said second resistor, said amplifying transistor and said output; and

a second variable impedance element, operatively connected to said third resistor, said output and said means for providing said level control signal, so that the impedance of said variable impedance element varies in dependence upon said level control signal, said first and second variable impedance elements having identical electric characteristics;



said means for providing a level control signal including a negative feedback circuit comprising:

a pilot filter, operatively connected to the output of said second variable level converting unit, for extracting a pilot signal;

a pilot signal amplifier operatively connected to said pilot filter;

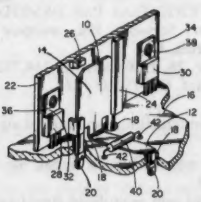
a rectifier circuit, operatively connected to said pilot signal amplifier; and

an expanded circuit, operatively connected to said rectifier and operatively connected to said first and second variable impedance elements, for providing said level control signal.

4,320,349
THERMAL COUPLER FOR AMPLIFIER TEMPERATURE COMPENSATION

Alan W. Freers, Lombard, and Daniel I. Pittenger, Libertyville, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 13, 1979, Ser. No. 103,244
Int. Cl.³ H03F 3/04
U.S. Cl. 330—66 **16 Claims**



1. In a semiconductor circuit on a conductor board including a first semiconductor output device and second semiconductor control device for regulating the operation of said first semi-

conductor device, said first and second semiconductor devices having conductivity characteristics which vary in substantially the same manner with temperature variations, a thermal transfer system for stabilizing the operation of said first semiconductor device comprising:

a heat sink positioned on said conductor board, said heat sink being in thermal contact with said first semiconductor output device; and

a thermal coupler including:

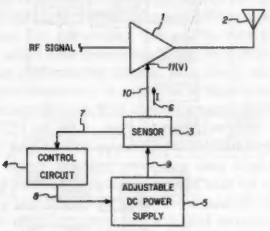
a first base member having connecting means located on a lower surface of said base member for mounting said thermal coupler on said conductor board, said second semiconductor control device being in thermal contact with an upper surface of said base member; and a second member integrally connected to said base member and in thermal contact with said heat sink such that said first and second semiconductor devices operate at an approximately constant temperature differential.

4,320,350

SLIDING POWER SUPPLY FOR RF POWER AMPLIFIER

Michael J. Drapac, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 29, 1979, Ser. No. 98,565
Int. Cl.³ H03F 1/02
U.S. Cl. 330—202 **4 Claims**



1. A sliding power supply for a radio frequency power amplifier with a variable power supply input impedance Z, comprising:

power supply means for providing a direct current signal to the radio frequency power amplifier;

current sensor means for sensing the direct current signal to the radio frequency power amplifier; and

control circuit means for controlling the voltage from the power supply means such that when the variable power supply input impedance of the power amplifier is low the direct current voltage is raised in response to the current sensed by the current sensor means and when the variable power supply impedance is high, the direct current voltage is lowered in response to the current sensed by the current sensor means.

4,320,351

DIFFERENTIAL AMPLIFYING SYSTEM WITH BOOTSTRAPPING

Floyd A. Brown, Jr., Palo Alto, and Dilip G. Saraf, Atherton, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Feb. 25, 1980, Ser. No. 124,551
Int. Cl.³ H03F 1/34, 3/45
U.S. Cl. 330—260 **3 Claims**

1. In a bootstrapped balanced differential amplifier system having a high common mode rejection ratio and input impedance for amplification of low level differential mode ac signals, the combination comprising,

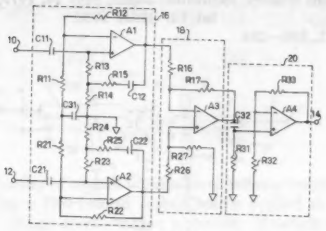
first and second operational amplifiers of the same type and each having inverting and noninverting inputs and an output,

first and second input coupling capacitors for differentially connecting a signal to be amplified to the noninverting inputs of said first and second operational amplifiers,

first and second balanced negative feedback means comprising first and second resistors, respectively, for degenerative feedback from the output of each of said amplifiers to its own inverting input,

first and second balanced voltage divider networks connecting said noninverting inputs to ground for the supply of charging currents to said first and second input coupling capacitors and input bias currents to said inverting inputs, of said first and second amplifiers, respectively,

first and second balanced positive feedback means connecting the outputs of the first and second amplifiers to taps on



said first and second balanced voltage divider networks, respectively, for regenerative feedback from the output of each of said amplifiers to its own noninverting input,

said first and second balanced positive feedback means comprising only passive circuit elements, each said positive feedback means comprising series connected resistor-capacitor means for limiting regenerative feedback gain for stable amplifier operation and for preventing regenerative feedback of amplifier offset voltage to avoid latchup,

a third operational amplifier having inverting and noninverting inputs and an output, and

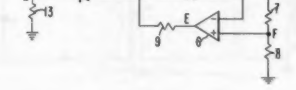
means for connecting the outputs of said first and second amplifiers to the respective inverting and noninverting inputs of said third amplifier whereby the output from said third amplifier comprises the voltage difference of the first and second amplifier outputs.

4,320,352

INPUT OPTIMIZED FET BIAS CIRCUIT

Michael D. Rubin, Saratoga, and Pang T. Ho, Mountain View, both of Calif., assignors to Ford Aerospace & Communications Corp., Detroit, Mich.

Filed Jan. 29, 1980, Ser. No. 116,527
Int. Cl.³ H03F 3/16
U.S. Cl. 330—277 **14 Claims**



1. An adaptive gate bias circuit for a field effect transistor having a gate, a drain, and a source, comprising:

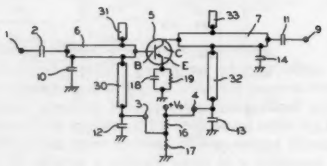
a bias reference voltage;
an operational amplifier having a first input connected to the bias reference voltage; and
a first resistance connected between the output of the amplifier and the gate of the FET;
wherein said operational amplifier is not connected to said drain and is not connected to said source;
wherein said circuit changes the bias voltage on the gate as a function of the amplitude of an input signal coupled to the gate.

4,320,353

SOLID-STATE AMPLIFIER CIRCUIT FOR HIGH-FREQUENCY SIGNALS

Yutaka Sasaki, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 1, 1980, Ser. No. 145,850
Claims priority, application Japan, May 14, 1979, 54-58907
Int. Cl.³ H03F *3/60*
U.S. Cl. 330—286 **3 Claims**



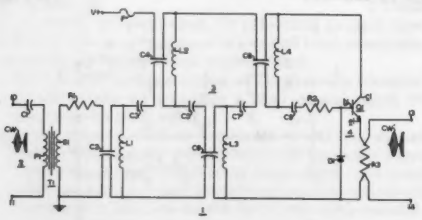
1. A high-frequency amplifier circuit of the type including a microstrip-line-bearing substrate having input, output, source and grounding terminals, an amplifier element mounted on the substrate and coupled to the input and output terminals thereon, and biasing means formed on the substrate for applying a biasing voltage to the amplifier element, said circuit being characterized in that said biasing means comprises a first stub coupled to at least one of said input and output terminals, a second stub coupled at one end to the same terminal to which the first stub is coupled, and means for coupling the other end of said second stub to said source terminal, said first and second stubs serving substantially as an open stub and a short stub, respectively, for the center operating frequency of said high-frequency amplifier circuit, the sum of the lengths of said first and second stubs being substantially equal to a quarter of the wavelength at said center operating frequency.

4,320,354

FAIL-SAFE BAND-PASS CIRCUIT

John R. Harrison, Gibsonia, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Nov. 26, 1979, Ser. No. 97,264
Int. Cl.³ H03F *3/04*
U.S. Cl. 330—306 **9 Claims**



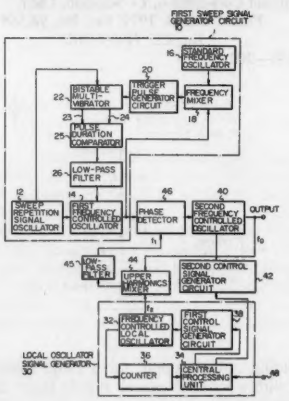
1. A fail-safe band-pass filter for passing a center frequency signal and for attenuating all other frequency signals comprising, a resonant circuit including a series-connected capacitor and an inductive winding for passing said center frequency signal, a multistage parallel tuned circuit coupled to said resonant circuit, and an amplifying circuit coupled to said multistage parallel tuned circuit whereby a critical component or circuit failure is incapable of causing the unattenuated passage of the other frequency signals.

4,320,355

SWEEP SIGNAL GENERATION SYSTEM

Katsuaki Kawagoe, and Hideki Kawaji, both of Tokyo, Japan, assignors to Anritsu Electric Company Limited, Tokyo, Japan

Filed Mar. 31, 1980, Ser. No. 135,730
Claims priority, application Japan, Mar. 31, 1979, 54-37742
Int. Cl.³ H03L *7/12*; H03B *23/00*
U.S. Cl. 331—2 **7 Claims**

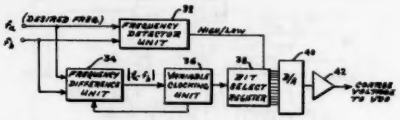


1. A sweep signal generation system, comprising:
a source of an input sweep signal having a frequency which is swept periodically over a predetermined range of frequencies;
a frequency controlled oscillator circuit for producing an output sweep signal;
a source of a local oscillator signal of fixed frequency;
a harmonic frequency mixer circuit coupled to receive said output sweep signal and said local oscillator signal, for thereby producing an intermediate frequency signal whose frequency has a value which is equal to the difference between the frequencies of said output sweep signal and of a harmonic of said local oscillator signal; and
a phase detector circuit coupled to receive said input sweep signal and said intermediate frequency signal for producing a control signal having a value which is determined by the magnitude of a difference in phase between said input sweep signal and said intermediate frequency signal;
said control signal being applied to said frequency controlled oscillator circuit for controlling the frequency of oscillator thereof such as to reduce said phase difference between said input sweep signal and said intermediate frequency toward zero, whereby the frequency of said output sweep signal is swept by a frequency deviation equal to that of said input sweep signal, in relation to the frequency of said harmonic of said local oscillator signal.

4,320,356
HIGH SPEED FREQUENCY ACQUISITION APPARATUS FOR MICROWAVE SYNTHESIZERS

Edward M. Perdue, Framingham, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 21, 1980, Ser. No. 123,335
Int. Cl.³ H03L 7/16
U.S. Cl. 331—11 **5 Claims**



1. In a microwave synthesizer, a high speed frequency acquisition apparatus comprising in combination:

frequency detector means receiving a first and second frequency and providing either a high or low output, said high output corresponds to said first frequency being greater than said second frequency, said low output corresponds to said first frequency being less than said second frequency,

means for frequency differencing receiving said first and second frequency, said frequency differencing means providing an output, said output equals the absolute magnitude of said first frequency minus said second frequency,

clock means for generating a variable rate clocking frequency, said clock means receiving said output from said frequency differencing means, said clock means generating a clock frequency in response to said frequency differencing means output, said clock frequency defining a time period,

a bit select register for providing a plurality of digital bits, said bit select register receiving said high/low output from said frequency detector means, said bit select register receiving said clock frequency from said clock means, said bit select register generating a digital word in response to said clock frequency and said high/low output, and

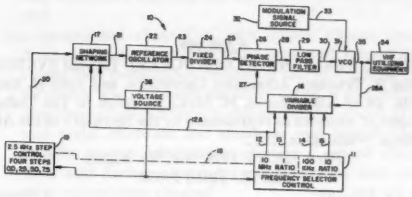
a D/A converter means receiving said digital word from said bit select register, said D/A converter means converting said digital word to an analog voltage, said D/A converter means providing said analog voltage as an output, said analog voltage tuning said microwave synthesizer to the desired frequency.

4,320,357
VHF-FM FREQUENCY SYNTHESIZER

Paul G. Wulfsberg, 8910 W. 104th Ter., Overland Park, Kans. 66212; Dennis L. Fredrickson, 2208 W. 104th St., Leawood, Kans. 66206; Gregory L. Triplett, Rte. 1, Box 76; Ralph J. Crumrine, 1621 Sunvale Dr., both of Olathe, Kans. 66061, and Cole E. Cunningham, 6202 Pineview Rd., Dallas, Tex. 75240

Continuation-in-part of Ser. No. 959,642, Nov. 13, 1978, abandoned, which is a continuation of Ser. No. 811,630, Jun. 30, 1977, abandoned. This application Jul. 1, 1980, Ser. No. 165,026
Int. Cl.³ H03L 7/18; H03C 3/09
U.S. Cl. 331—16 **2 Claims**

1. A voltage variable reference crystal oscillator and control means therefor, for use as a reference oscillator in a frequency synthesizer loop; said loop comprising a phase detector, a voltage controlled output oscillator receiving the output of said phase detector as a frequency controlling input thereto, the output of said voltage controlled oscillator comprising the output of said frequency synthesizer and being additionally applied to a selectively variable frequency divider, the output of said reference oscillator and the output of said frequency divider applied as respective inputs to said phase detector, whereby said voltage controlled oscillator is frequency controlled such that the output frequency of said frequency divider equates to that of said reference oscillator, said frequency divider comprising means for selectively establishing incremental step tuning steps of such voltage controlled oscillator over a predetermined range of operating frequencies; said reference oscillator control means effecting variation in the voltage controlled oscillator output frequency in further selected sub-incremental steps between said frequency divider defined incremental tuning steps and comprising DC variation control means providing a frequency controlling DC input to said reference oscillator for varying said reference frequency oscillator output over predetermined voltage bias controlled tuning steps to higher frequencies from a loop output incremental step-defining output frequency selected; wherein said DC variation control means includes voltage divider means

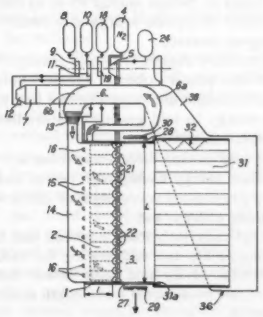


having a plurality of control voltage level defining output taps and including a DC voltage supply source applied as input across said voltage divider means; a plurality of switch means connected between respective individual ones of said output taps and a DC frequency-controlling input means of said reference oscillator, and means for selectively controlling activation of individual ones of said switch means to effect different ones of said reference frequency oscillator sub-incremental tuning steps; and further comprising voltage modifying means connected to said voltage divider means to selectively vary the voltages appearing at said voltage level taps to effect selectively different DC control voltage output ranges for each of contiguous portions of the frequency synthesizer output frequency range.

4,320,358
GASDYNAMIC LASERS

Richard Heidmann, Vernon, and Jacques P. Thieck, Paris, both of France, assignors to Societe Europeenne de Propulsion, France

Continuation of Ser. No. 645,689, Dec. 31, 1975, abandoned. This application Mar. 17, 1978, Ser. No. 887,754
Claims priority, application France, Dec. 31, 1974, 7443476
Int. Cl.³ H01S 3/05
U.S. Cl. 372—90 **15 Claims**



1. A method of heating an energizing gas in a gas-dynamic laser, comprising:

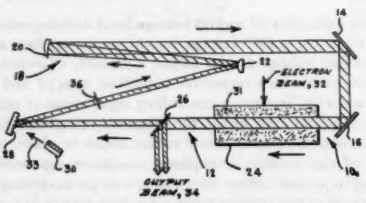
preheating said energizing gas by heat exchange to a temperature above 500° K.;
introducing said preheated gas into a heating chamber at a temperature above 500° K.; and
heating said preheated gas in said heating chamber;
mixing said heated gas with a lasing active gas.

4,320,359

OPTICAL BEAM MODE CONTROLLED LASER SYSTEM

Phillip R. Peterson; Athanasios Gavrielides, and John H. Erkkila, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 26, 1979, Ser. No. 52,162
Int. Cl.³ H01S 3/098
U.S. Cl. 372—18 **7 Claims**



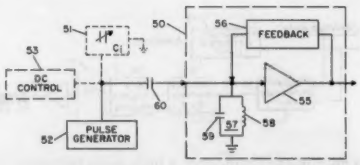
1. An optical beam mode controlled high power laser system comprising:
(a) a resonator, said resonator forming a resonant cavity and being defined by at least one reflective surface and a high efficiency diffraction grating in optical alignment with said reflective surface and means optically interposed between said reflective surface and said grating for containing a lasing medium therein;
(b) a lasing medium located within said lasing medium containing means;
(c) means operable with said lasing medium for initiating a lasing action therein in order to produce a coherent beam of high power radiant energy;
(d) said grating being positioned with respect to said high power beam of radiant energy so as to receive said high power beam of radiant energy at a predetermined angle with respect thereto;
(e) means optically aligned with said grating for producing a beam of low power coherent radiant energy at a preselected wavelength and directing said low power beam of radiant energy to said grating at a predetermined angle with respect thereto;
whereby said grating directs therefrom a combined beam of radiant energy having high power and being locked to said preselected wavelength of said low power beam of radiant energy; and
(f) means optically interposed between said lasing medium containing means and said grating for outcoupling from said resonant cavity said high power beam of radiant energy at said preselected wavelength as an output of said laser system;
whereby said mode controlled high power laser system permits gain-switched spike suppression, control of cavity tuning and cavity mode selection.

4,320,360

CURRENT PULSE-INJECTED, PHASE-LOCKED OSCILLATOR

Robert M. Thomas, Renton, Wash., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Jan. 28, 1980, Ser. No. 115,638
Int. Cl.³ H03L 7/24
U.S. Cl. 331—172 **12 Claims**



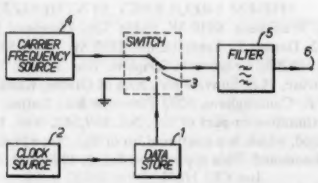
1. A phase-locked oscillator comprising:
(a) voltage-controlled oscillator means for generating an output signal having a distorted symmetrical, nonsquare waveform with a distorted apex whose frequency and phase may be controlled in response to an input signal; and
(b) means for selectively, exclusively applying a series of current pulses, having a predetermined frequency, to the voltage-controlled oscillator means as the input signal whereby the voltage-controlled oscillator means is caused to be phase-locked to the series of current pulses.

4,320,361

AMPLITUDE AND FREQUENCY MODULATORS USING A SWITCHABLE COMPONENT CONTROLLED BY DATA SIGNALS

Cornelis J. Kikkert, Hemel Hempsted, England, assignor to Marconi Instruments Limited, Chelmsford, England

Filed Dec. 3, 1979, Ser. No. 99,899
Claims priority, application United Kingdom, Jul. 20, 1979, 25298/79
Int. Cl.³ H03C 1/00, 3/00
U.S. Cl. 332—16 R **7 Claims**

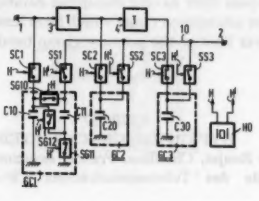


1. A modulation signal source including a data store containing predetermined reference data relating to modulation characteristics, means for repetitively and non-destructively reading stored data from said store under the control of a clock signal to form a digital bit stream containing a high frequency component related to the frequency of the clock signal and low frequency components related to the nature of the sequence of the digital bits in said stream, and switchable means responsive to the digital bit stream and a carrier signal to form a modulated carrier signal having a modulation characteristic which is determined by said low frequency components of said digital bit stream.

4,320,362
FILTER FOR ANALOG SIGNALS

Maurice G. Bellanger, Paris, and Jean Gaillard, Verrieres-le-buisson, both of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Jul. 18, 1979, Ser. No. 58,578
Claims priority, application France, Jul. 27, 1978, 78 22248
Int. Cl.[3] H03H *15/02, 19/00;* G11C *27/00*
U.S. Cl. 333—165 9 Claims

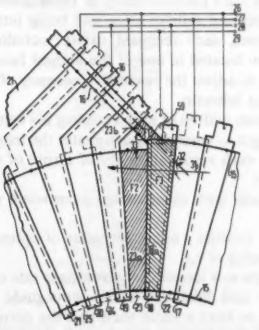


1. An analog signal processor comprising a plurality of charge storage circuits, each comprising an input, an output, a common terminal, a first capacitor and first switching means for connecting a first electrode of the first capacitor to said input, said analog signal processor being capable of deriving a weighted sum of various signals to be applied to the inputs of said charge storage circuits, at least one of the charge storage circuits and a second switching means of said analog signal processor is connected between the second electrode of the capacitor and the output of said one of the charge storage circuits, and said one of the charge storage circuits further comprises third and fourth switching means for connecting selectively the second or the first electrode of the first capacitor of said one of the charge circuits to its common terminal.

4,320,363
MONOLITHICALLY INTEGRATED FILTER CIRCUIT

Walter Kaschte, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 14, 1980, Ser. No. 121,411
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912801
Int. Cl.[3] H03H *17/06;* G11C *27/00, 21/00, 19/28*
U.S. Cl. 333—165 9 Claims



1. A filter circuit monolithically integrated on a semiconductor substrate comprising:

a first charge transfer device having a closed loop transmission channel;

at least two branch charge transfer devices each having a transmission channel of a pre-determined width, being respectively connected at nodal points to said first charge transfer device and being operationally connected to one input or one output of said filter circuit,

each charge transfer device having a plurality of adjacent shift electrodes overlying their respective transmission channels and said first charge transfer device having a nodal electrode at each nodal point simultaneously overlying the transmission channel of said first charge transfer device and a branch charge transfer device to couple said transmission channels;

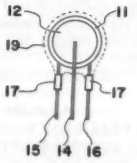
said first charge transfer device and each branch charge transfer device having a further electrode, respectively adjacent said nodal electrode, said further electrodes respectively overlying the transmission channels of the charge transfer devices, the sum of the areas of said further electrodes equaling the area of said nodal electrode; and

the transmission channel of each branch charge transfer device being disposed at an acute angle with respect to the closed loop transmission channel of said first charge transfer device which permits the entire width of said transmission channel of each branch charge transfer device to abut said nodal electrode and maintains said branch charge transfer device transmission channel a spaced distance from said further electrode which overlies said closed loop transmission channel.

4,320,364
CAPACITOR ARRANGEMENT

Yukio Sakamoto, Fukui; Yoshio Arakawa, Takefu, and Seiichi Takahashi, Fukui, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 2, 1980, Ser. No. 155,208
Claims priority, application Japan, Jun. 11, 1979, 54-79835[U]
Int. Cl.[3] H03H *7/01*
U.S. Cl. 333—167 10 Claims



1. A capacitor arrangement for filtering high frequency noise signals in a lead line and bypassing the filtered noise signals to ground, comprising:

(a) a dielectric body formed in the shape of a plate having opposite flat surfaces;

(b) first and second electrodes deposited on respective said opposite flat surfaces of said dielectric body such that a predetermined capacitance is defined between said first and second electrodes;

(c) a first terminal member electrically connected to said first electrode, said first terminal member partly overlapping said first electrode and extending laterally outward from said dielectric plate;

(d) second and third terminal members electrically connected to said second electrode, each of said second and third terminal members partly overlapping said second electrode and extending laterally outward from said dielectric plate; and

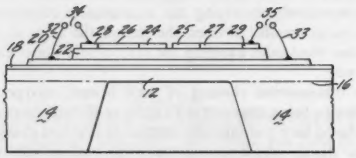
(e) first and second magnetic elements mounted on said second and third terminal members, respectively, to increase the inductance of the respective terminal member on which it is mounted.

4,320,365

FUNDAMENTAL, LONGITUDINAL, THICKNESS MODE BULK WAVE RESONATOR

James F. Black, Newington, Conn.; Richard A. Courtney, Vienna, Va.; Thomas W. Grudkowski, Glastonbury, Conn.; Philip T. Norusis, Falls Church, Va., and Harry R. Wood, Gaithersburg, Md., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 3, 1980, Ser. No. 203,211
Int. Cl.³ H03H 9/17, 9/205, 9/50, 9/56
U.S. Cl. 333—187 9 Claims



1. A longitudinal, fundamental, bulk mode resonator comprising:

a substrate having first and second substantially planar surfaces, a portion of said substrate being thinned to provide a membrane having first and second substantially coplanar surfaces separated by a distance of from about three microns to about fifteen microns;

a metal counter electrode disposed on said substrate with a region of said counter electrode adjacent to said first surface of said membrane;

a film of low conductivity piezoelectric material having a thickness of from about two microns to about ten microns disposed adjacent said region on a side of said counter electrode opposite to said membrane; and

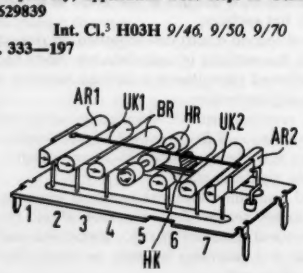
a metal top electrode disposed on said film adjacent said region, said top electrode and said counter electrode providing electroacoustic coupling with said film, the distance between a surface of said top electrode opposite to said film and said second surface of said membrane comprising a half wavelength of a desired longitudinal bulk acoustic wave.

4,320,366

CARRIER FREQUENCY COMMUNICATION TRANSMISSION SYSTEM HAVING PREMODULATION

Wilhelm Volejnik; Friedrich Kuenemund, both of Munich; Karl Traub, Olching, and Hans Albsmeier, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 16, 1978, Ser. No. 916,292
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2629839
Int. Cl.³ H03H 9/46, 9/50, 9/70
U.S. Cl. 333—197 10 Claims



1. In a carrier frequency communication transmission system which has a premodulation band above the transmission frequency position of a primary group band of 60–108 kHz and which utilizes mechanical filters and a common filter to filter out the primary group band, the improvement comprising:

a plurality of bending resonators as the mechanical filters; and

a longitudinal element coupling said bending resonators, the lower limit of the frequency range of the premodulation band set at a frequency spacing of at least 4 kHz from the upper band limit of the primary group band, and

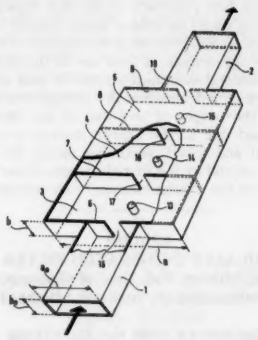
said longitudinally coupled bending resonators constituting a band-pass filter having disruptive natural oscillations in its lower attenuation range which lie at least 12 kHz below the lower limit of the primary group band.

4,320,367

HYPERFREQUENCY FILTER

Jean-Pierre Boujet, Chatillon, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Mar. 27, 1980, Ser. No. 134,734
Claims priority, application France, Mar. 29, 1979, 79 07887
Int. Cl.³ H01P 1/208
U.S. Cl. 333—209 1 Claim



1. A hyperfrequency filter comprising a series connection of an inlet length of waveguide, a plurality n of resonant cavities, and an outlet length of waveguide, said lengths of waveguide and said resonant cavities being of rectangular cross-section, having longer and shorter sides, and being interconnected by coupling irises, each resonant cavity including a dielectric tuning screw located in one of the longest faces of the cavity and serving to adjust the resonant frequency of the cavity, the improvement wherein:

the optimum width i of each coupling iris being a function of the length a_c wherein a_c designates the length of the large side of each resonant cavity of a row of such resnonant cavities;

and wherein with other design parameters remaining constant,

said filter exhibits a minimum value of optimum width i for some value of a_c,

each length a_c is longer than the longer side of the cross-section of said inlet and outlet waveguide lengths and is chosen to have a value such that the corresponding optimum width i for each coupling iris is substantially equal to said minimum value, and

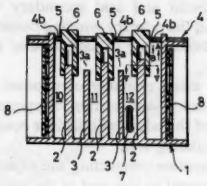
wherein the width of each coupling iris is, in fact, substantially equal to said minimum optimum width;

whereby, the filter may be shifted over a wide range of frequencies with very little variation in the frequency characteristic solely by adjusting the dielectric turning screws.

4,320,368
FILTER FOR MICROWAVES

Mitsuo Sekiguchi, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1980, Ser. No. 137,494
Claims priority, application Japan, Apr. 9, 1979, 54-46762[U]
Int. Cl.³ H01P 1/20, 1/208, 7/06
U.S. Cl. 333—209 10 Claims

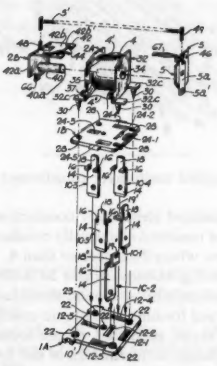


1. In a microwave filter having a conductive housing open on one end and having a plurality of resonator cavities separated from one another by walls; resonator rods disposed within the respective resonator cavities; coupling windows formed in the respective walls for coupling the respectively adjacent resonator cavities; and respective means associated with each said resonator rod for adjusting the capacitance effect of said resonator rods; the improvement wherein said adjusting means includes a respective trimming cap made from a dielectric material and fitting snugly over the end of each said resonator rod with sufficient frictional resistance therebetween to allow adjustment of the position of said trimming caps along the respective resonator rod.

4,320,369
ELECTRICAL RELAY DEVICE AND METHOD OF MAKING THE SAME

Alexander E. Bukala, Chicago, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.

Filed Jan. 21, 1980, Ser. No. 113,580
Int. Cl.³ H01H 50/02
U.S. Cl. 335—202 28 Claims

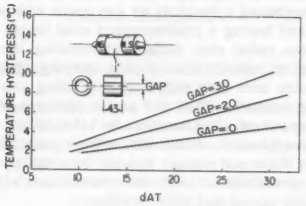


1. In an electrical plug-in unit including a support base, terminal blade members projecting from said support base, and an electromagnetic device on said support base, the improvement wherein said support base includes an outer insulating base plate with spaced apertures into which the terminal blade members have been inserted from the inner face of said base plate to project beyond the same, said terminal blade members having laterally projecting portions extending along said inner face of the base plate, and an inner insulating clamp plate, some of said terminal blade members projecting through said clamp plate to form terminal lugs, electrical conductors extending from said electromagnetic device to said terminal lugs on said terminal blade members; and securing means both interconnecting and securing together said base plate and clamp plate so that said laterally projecting portions of said terminal blade members are sandwiched and clamped between said base and clamp plates and permanently anchoring said device to said support base.

4,320,370
THERMO-SENSITIVE REED SWITCH

Tomio Itou, Ichikawa, and Toshiyuki Kitagawa, Chiba, both of Japan, assignors to TDK Electronics Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 943,156, Sep. 18, 1978, abandoned. This application Apr. 28, 1980, Ser. No. 144,599
Claims priority, application Japan, Nov. 7, 1977, 52-149282
Int. Cl.³ H01H 37/58
U.S. Cl. 335—208 6 Claims

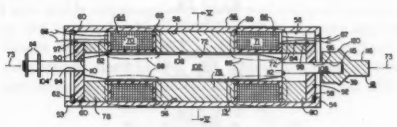


1. In a thermo-sensitive reed switch that includes a reed switch element having at least two magnetic reeds surrounded by a tubular enclosure, a thermo-sensitive magnetic element located on said tubular enclosure near the contacting portions of said reeds, and at least two permanent magnets attached to each end of said magnetic element and similarly polarized endwise and alongside of said reeds, the improvement wherein said thermo-sensitive magnetic element is slit therein in a portion thereof adjacent to said magnetic reeds, and wherein said permanent magnets contain no slits.

4,320,371
TRACTIVE SOLENOID DEVICE

Forrest E. Coyle, Penn Hills Township, Allegheny County, and James W. Barkell, Jr., Penn Township, Westmoreland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 14, 1980, Ser. No. 167,954
Int. Cl.³ H01F 7/08
U.S. Cl. 335—256 6 Claims



1. A tractive solenoid device comprising:

an elongated housing made of a soft magnetic material including interior cylindrical wall extending between the ends thereof;

an inner end pole piece made of a circularly hollow soft magnetic material slidably received and supported by said interior cylindrical wall and including an inner diameter defining the middle portion of an armature receiving center bore;

first and second substantially identical circular coil members slidably received and supported by said interior cylindrical wall adjacent the sides of said inner end pole piece and having inner diameters coextensive with said center bore;

first and second substantially identical outer end pole pieces each made of a circularly hollow soft magnetic material and slidably received and supported by said interior cylindrical wall adjacent the outer sides of said first and second coil members, respectively, and including inner diameters being further coextensive with said center bore to terminate said bore;

first and second non-magnetic circular end plate members slidably received and supported by said interior cylindrical wall adjacent the outer ends of said end pole pieces and extending radially inward to mutually aligned center bearing openings;

a pair of retainer members extending radially inward from at the ends of said housing for axially holding the outer sides of said end plate members in a mutually stacked relationship with the pole pieces and the coil members; and

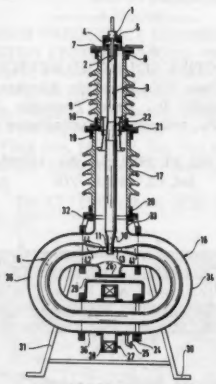
a double acting plunger member made of a soft magnetic material including a cylindrical armature section having a predetermined cylindrical air gap space with said center bore and having a predetermined axial length extending between radial stop surfaces terminating the armature section at radially inward ends carrying opposite shaft extension ends with said shaft ends being journalled for sliding support within said center openings of said first and second end plate members such that selective momentary energization of said first and second coil members axially slides said plunger member between opposite positions upon abutment of the armature section adjacent said first and second end plate members.

4,320,372

CURRENT TRANSFORMER FOR A HIGH-TENSION INSTALLATION

Edmond Thuries, Meyzieu; Jean-Paul Sadoulet, Lyons, and Alain Sanchez, Villeurbanne, all of France, assignors to Alsthom-Atlantique, Paris, France

Filed Oct. 7, 1980, Ser. No. 194,744
Claims priority, application France, Oct. 11, 1979, 79 25306
Int. Cl.³ H01F *27/02, 40/06*
U.S. Cl. 336—92 **8 Claims**



1. A current transformer for a high-tension installation, said transformer comprising:

an insulation chamber,

coaxially disposed inner and outer conductors housed in said insulation chamber,

a primary winding,

a secondary winding,

a magentic circuit,

said primary winding comprising a primary turn suspended from said coaxially disposed inner and outer conductors,

said insulation chamber including an annular tank housing said primary turn and being constituted by a plurality of generally tubular metal components connected end to end, with at least some of said components being curved,

said insulation chamber containing a dielectric fluid surrounding the primary turn,

said magnetic circuit and said secondary winding being disposed around the primary winding outside of said annular tank and around one of said tubular metal chamber components,

said one tubular metal chamber component constituting a carrier component, said carrier component being connected to one of the adjacent chamber components via an electrically insulating seal,

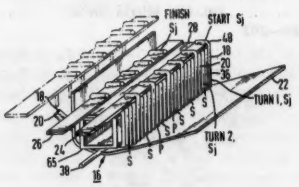
an electrical connection connecting the adjacent end of said adjacent component to that end of the carrier component to provide electrical continuity of said chamber which is spaced therefrom via a path which passes around the outside of both said magnetic circuit and said secondary winding.

4,320,373

POWER TRANSFORMER WITH HIGH COUPLING COEFFICIENT

Walter R. Witte, Asbury, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 63,806, Aug. 6, 1979, Pat. No. 4,258,467.
This application Nov. 17, 1980, Ser. No. 207,720
Int. Cl.³ H01F *27/30*
U.S. Cl. 336—183 **5 Claims**



1. A closely coupled multi-layer transformer comprising: a core,

a first coil of insulated electrically conductive wire,

N second coils of insulated electrically conductive wire each having T turns where N is greater than 4,

said first coil having M turns where M is about N×T, the turns of all said coils being wound about said core about a common axis and forming at least two concentric cylindrical layers of turns, each turn of the second coils being adjacent a separate, different turn of the first coil to form an array of alternating first and second bifilar coil turns along each said cylindrical layers, and

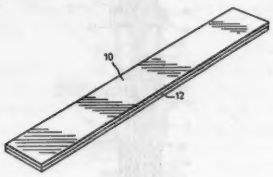
at least two pairs of spaced current carrying conductors, one pair between the inner and outer layers and corresponding to the inner layer and a second pair over and corresponding to the outer layer, one conductor of each pair being connected to one end of each second coil of the one conductor's corresponding layer and the other conductor of each pair being connected to the other end of each said second coil of the other conductor's corresponding layer.

4,320,374

ELECTRIC FUSES EMPLOYING COMPOSITE ALUMINUM AND CADMIUM FUSE ELEMENTS

Vojislav Narancic, Anjou, and Milenko Braunovic, Otterburn Park, both of Canada, assignors to Kearney-National (Canada) Limited, Guelph, Canada

Continuation-in-part of Ser. No. 22,381, Mar. 21, 1979, abandoned. This application May 22, 1980, Ser. No. 152,230
Int. Cl.³ H01H 85/12
U.S. Cl. 337—162 7 Claims



1. An electric fuse for use in circuits of at least 1000 volts and of the current limiting type comprising:
a tubular housing of insulating material;
two spaced terminals mounted on said housing for connection of the fuse in an electric circuit;
at least one metal fuse element mounted within the housing with the two ends of each element connected respectively to the said two terminals to form a respective conducting path therebetween;
each fuse element being embedded in and surrounded by silica sand disposed within the housing;
characterized in that:
each fuse element comprises a cadmium portion and an aluminum portion, each of which provides a corresponding continuous current carrying path between the said terminals;
each metal being present in the fuse element in an amount not less than 3% by volume of the total;
the said portions being bonded to one another at adjoining contacting surfaces to constitute a composite metal element;
wherein the cadmium portion due to its lower melting point will melt before the aluminum portion to increase the current density through the unmelted aluminum portion.

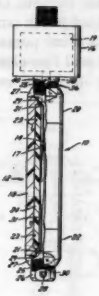
4,320,375

HIGH CURRENT UNDER OIL EXPULSION FUSE

Wayne W. Lien, Milwaukee, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Mar. 28, 1980, Ser. No. 134,966
Int. Cl.³ H01H 85/02, 85/40
U.S. Cl. 337—204 18 Claims

1. A high current under oil expulsion fuse comprising a hollow tubular assembly having an electrically conductive contact at each end,
a fuse link supported within the assembly and being connected to each of said contacts,
a gas pressure retention chamber supported on one end of said housing, and
a gas pressure discharge means in the opposite end of said housing whereby gas pressure built up in the retention chamber on fusing of the fuse link will blow back through the discharge means in the housing when the pressure



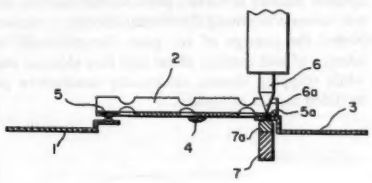
drops in the assembly to clear the assembly of arc products.

4,320,376

STRESS RELIEVING WELD JOINT FOR COMPOSITE FUSIBLE ELEMENT

Robert J. Panaro, 12 Coleman Rd., Byfield, Mass. 01922; Richard W. Robbins, 10 Columbus Ave., Newburyport, and Charles F. Smith, Northern Blvd., Plum Island Newbury, both of Mass. 01950

Filed Jul. 16, 1980, Ser. No. 169,329
Int. Cl.³ H01H 85/16
U.S. Cl. 337—252 4 Claims



1. A composite fusible element for use in electric fuses comprising:
(a) axially outer relatively rigid tabs;
(b) an axially inner relatively fragile perforated fusible element;
(c) said axially outer tabs are lapped in relation to said fusible element;
(d) welds conductively interconnecting said tabs and said fusible element in the area of said lapped relation;
(e) said welds are essentially linear and disposed transverse to the longitudinal axis of said fusible element and form fusible hinges projecting beyond the planes defined by said fusible element and said tabs and allowing relative movement between said fusible element and said tabs.

4,320,377

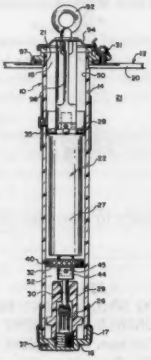
ARC GAS CONTROL DEVICE FOR A POWER CLASS FUSE HAVING LOAD BREAK CONTACTS

J. Howard Shaw, Racine, Wis., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Mar. 30, 1981, Ser. No. 248,993
Int. Cl.³ H01H 85/38
U.S. Cl. 337—278 8 Claims

1. In a high voltage power class fuse comprising a canister of electrical insulating material having a predetermined cross-sec-

tional dimension with an open end and a closed end, a female load break contact mounted at the closed end of said canister and a fuse element assembly dimensioned for insertion into said canister including a fuse element coupled mechanically and electrically to a male load break contact dimensioned for receipt in said female load break contact to complete an electrical connection through said fuse element upon insertion of the fuse element assembly into said canister, the improvement comprising:



control means disposed between said female load break contact and said fuse element for controlling hot arc gases created upon the engagement of said male and female load break contacts, said control means having cross-sectional dimension similar to that of the interior dimension of said canister thereby to form a partition thereacross, said control means comprising filter means having a consistency to permit the passage of arc gases therethrough, into the interior of said canister about said fuse element assembly, while trapping therein electrically conductive particles included in said arc gases.

4,320,378

OXYGEN SENSOR

Harutaka Taniguchi; Kenichi Hara; Hideo Shiraishi, and Shinji Kiyofuji, all of Kawasaki, Japan, assignors to Fuji Electric Co. Ltd., Kanagawa, Japan

PCT No. PCT/JP79/00196, § 371 Date Mar. 18, 1980, § 102(e) Date Mar. 18, 1980, PCT Pub. No. WO80/00373, PCT Pub. Date Mar. 6, 1980

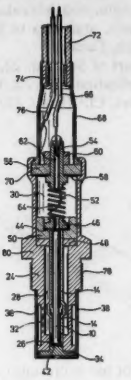
PCT Filed Jul. 26, 1979, Ser. No. 194,248

Claims priority, application Japan, Jul. 26, 1978, 53-91204

Int. Cl.³ H01L *7/00*

U.S. Cl. 338—34 **5 Claims**

1. An oxygen sensor for detecting a change of oxygen partial pressure in an ambient atmosphere through a change of electric resistance of transition-metal oxide, characterized in that a ceramic round rod (12) providing on its surface a thick membrane of transition-metal oxide (18), electrode thick membranes (14) divided into two parts in contact with said thick membrane (18) of transition-metal oxide and a protective layer (22) covering whole the thick membrane (18) of transition-metal oxide and at least part of electrode thick membranes (14) is inserted into a metal tube (24) having a closed end and holes (32) in its side wall and that one of said divided electrode thick membranes (14) is connected to a bottom of said metal tube (24) while the opposite electrode thick membrane (14) is connected to a connecting lead wire (66) which is drawn from an



opening of the metal tube (24) in insulation from said metal tube (24).

4,320,379

VOLTAGE NON-LINEAR RESISTOR

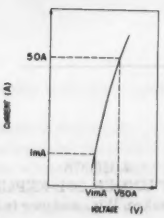
Masatada Yodogawa, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1980, Ser. No. 184,953

Claims priority, application Japan, Sep. 7, 1979, 54-114860; Apr. 2, 1980, 55-43190; Apr. 4, 1980, 55-44274; Apr. 17, 1980, 55-50777; Aug. 2, 1980, 55-106682; Aug. 2, 1980, 55-106683; Aug. 2, 1980, 55-106684

Int. Cl.³ H01C *7/10*

U.S. Cl. 338—21 **10 Claims**

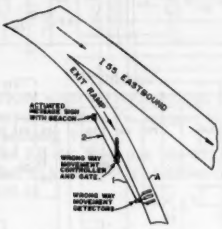


1. A voltage non-linear resistor which comprises a sintered body of a ceramic composition comprising zinc oxide at a ratio of 99.88 to 84.88 mol % as ZnO; a praseodymium oxide component at a ratio of 0.01 to 0.035 mol % as Pr_2O_3 and a lanthanum oxide component at a ratio of 0.01 to 0.035 mol % as La_2O_3 and a cobalt oxide component at a ratio of 0.1 to 15 mol % as CoO and a specific additional component selected from chromium oxide, boron oxide, silicon oxide, titanium oxide, tin oxide, zirconium oxide, niobium oxide, tantalum oxide, tungsten oxide and germanium oxide at a ratio of 0.0001 to 0.05 mol %.

4,320,380
ELECTRONICALLY CONTROLLED SAFETY MECHANISM FOR HIGHWAY EXIT RAMP

Louis N. Berard, St. Louis, and Leonard A. Stein, St. Louis County, both of Mo., assignors to Devices Development Corporation, St. Louis, Mo.

Filed Jul. 22, 1980, Ser. No. 171,148
Int. Cl.[3] E01F 13/00; G08G 1/00
U.S. Cl. 340—39 23 Claims



1. An electrically controlled safety mechanism for a highway exit ramp or other roadway and useful for alterting a driver of a vehicle as to the vehicle's incorrect direction of movement upon said ramp or other roadway and comprising, a series of electrically controlled detection means provided within the roadway and of the type capable of sensing the presence, correct, and incorrect direction of movement of a vehicle thereacross, a warning member and a support housing for said mechanism, a base means supporting said warning member and support housing laterally of the ramp or roadway, said warning member being pivotally mounted with respect to said housing and capable of being disposed in a nonoperative position and then pivoted into a horizontal position operatively across the roadway when its operations are initiated by the said electrically regulated detection means, drive means operatively associated with said housing for imparting when energized the pivotal movements to the said warning member, time operative electrical means electrically connected with said detection means, electrical controller means connected with said time operative electrical means, said electrical controller means initiating the energization of the said drive means for pivoting the warning member into its warning position when vehicle movement is detected in the incorrect direction, and said controller means prevented from initiating energization of the motor means by operation of the time operative electrical means when a vehicle is detected traveling in the correct direction.

4,320,381
GEAR RATIO INDICATOR

Paul D. Olivier, Scottsdale, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

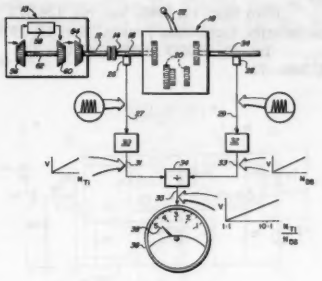
Filed Aug. 3, 1979, Ser. No. 63,212
Int. Cl.[3] G09B 9/04; G08B 21/00
U.S. Cl. 340—52 F 21 Claims

9. For use with a manually operated, shiftable gear transmission having a plurality of selectively available gear ratios for interconnecting input and output shafts of said transmission:

sensing means for sensing the speeds of said input and output shafts;

calculating means for determining the ratio of said sensed input shaft speed to said sensed output shaft speed; and

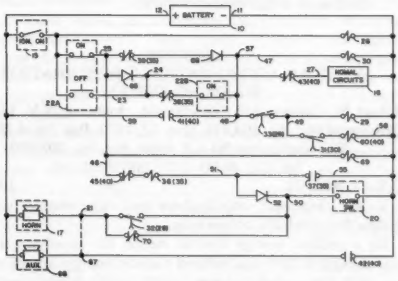
display means operably associated with said calculating means and having preselected indicia indicative of said selectively available gear ratios, said display means operable to display said determined ratio in terms of said preselected indicia.



4,320,382
AUTOMOTIVE ALARM

Dennis G. Roucek, Atlanta, Ga., assignor to Roman Industries, Inc., Atlanta, Ga.

Filed Aug. 4, 1980, Ser. No. 175,351
Int. Cl.[3] B60R 25/04, 25/10
U.S. Cl. 340—64 4 Claims



1. In an automobile including a selectively operable horn ring switch, an ignition switch for providing an ignition on condition and an alarm device for providing an audible alarm output, an alarm wherein the improvement comprises in combination:

means connecting said alarm to said selectively operable horn ring switch for providing a switch signal;

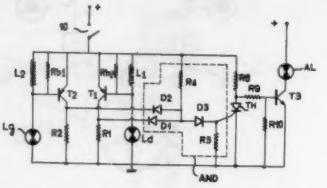
a first control means for actuating and latching on said alarm device in response to an alarm input;

a second control means responsive to said selectively operable horn ring switch for preventing said alarm input in response to provision of said switch signal within a predetermined time after initiation of said ignition on condition and alternately for providing said alarm input in response to an absence of an occurrence of said switch signal within said predetermined time after said initiation of said ignition on condition.

4,320,383
FAULT DETECTOR FOR VEHICLE BRAKE LIGHTS

Sylvain J. Lumbroso, Colombes, France, assignor to Jaeger, France

Filed Mar. 12, 1980, Ser. No. 129,572
Claims priority, application France, Mar. 19, 1979, 79 06838
Int. Cl.[3] B60Q *11/00*; G08B *23/00*
U.S. Cl. 340—71 9 Claims



1. A fault detecting light bulb switching circuit connectible to a DC supply source, including:

(a) an inductance in series arrangement with the filament of the light bulb;

(b) a light control switch connecting said series arrangement across said DC supply source;

(c) said inductance developing normally, when said filament is unbroken, a transitory voltage of self induction thereacross upon closure of the light control switch;

(d) an alarm device having a switching circuit coupled across said series arrangement and being biased to turn on the alarm device by said DC supply source upon closure of the light control switch;

(e) an alarm control circuit arranged across said series arrangement and having an input responsive to said voltage of self induction across said inductance upon closure of the light control switch for preventing said switching circuit to turn on said alarm device throughout the period of closure of the control switch.

4,320,384
VEHICLE ACCELERATION/DECELERATION WARNING SYSTEM

Robert W. Carlson, 410 Getzville Rd., Amherst, N.Y. 14226

Division of Ser. No. 103,410, Dec. 13, 1979, Pat. No. 4,258,353.
This application Nov. 3, 1980, Ser. No. 203,600
Int. Cl.[3] B60Q *1/26*; H01H *35/14*
U.S. Cl. 340—71 2 Claims

1. An electronic acceleration and deceleration warning system for a vehicle comprising:

(a) a radiant energy source means for supplying radiant energy to first and second radiant energy sensor means, said first radiant energy sensor means having resistance which is variable in proportion to the amount of radiant energy received;

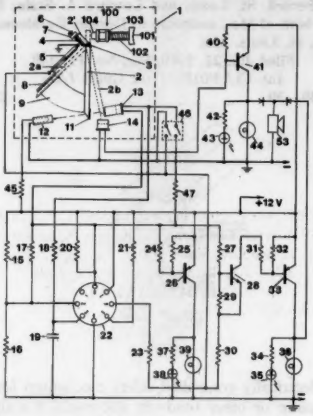
(b) a pendulum adapted to control the amount of radiant energy received by said radiant energy sensor means from said radiant energy source means in response to angular displacement of said pendulum around a pivot point;

(c) an oscillator circuit having a variable frequency output signal;

(d) a deceleration threshold switch means for switching on the output signal of said oscillator circuit in response to a minimum angular displacement of said pendulum in one direction;

(e) first and second alternately flashing deceleration warning lights having their rates of flashing dependent upon the frequency of said oscillator output signal when said oscillator output signal is switched on;

(f) an acceleration threshold switch means for turning on an acceleration warning signal in response to a minimum angular displacement of said pendulum in a second direction; and

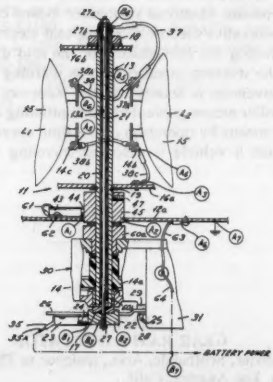


(g) said pendulum including aperture means for allowing passage of said radiant energy through said pendulum when said pendulum is at a minimum value of acceleration displacement in said second direction.

4,320,385
ROTATING WARNING LAMP

Arthur F. Bleiweiss, Toronto; Robert J. Wilkes, Caledon East, and Trevor E. Topley, Tottenham, all of Canada, assignors to Dominion Auto Accessories Limited, Toronto, Canada

Continuation of Ser. No. 727,953, Sep. 26, 1976, abandoned. This application Apr. 17, 1978, Ser. No. 896,730
Int. Cl.[3] B60Q *1/46*
U.S. Cl. 340—133 9 Claims



1. On a rotating lamp, the combination comprising

a base,

a shaft,

a motor having a housing,

journal means for journalling said shaft on said housing,

means for mounting said motor on said base,

a plurality of bulbs,

means for mounting said bulbs on said shaft,

means for completing a lamp circuit through said bulbs,

means for completing a motor circuit through said motor,

and means for preventing the current in said lamp circuit from passing through said journal means,

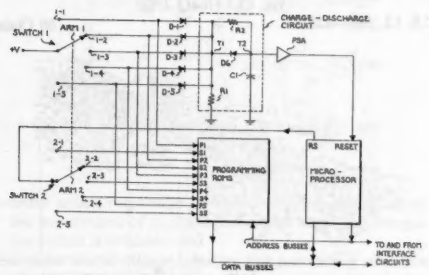
said means for mounting said motor on said base including means electrically insulating said motor housing from said base.

4,320,386

SELECTION AND POWER RESET CIRCUIT

Raymond W. Harris, Evington, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Jul. 30, 1980, Ser. No. 173,489
Int. Cl.[3] H04Q 9/00; G06F 3/02
U.S. Cl. 340—825.22 12 Claims



1. An improved selection and power reset circuit for use with a plurality of programming devices each having a respective power input which, when energized, energizes its respective programming device, and for use with a computer device coupled to said programming devices and having a reset input, said selection and power reset circuit comprising:

a. a programming switch having a power input terminal, and having a plurality of power output terminals for respective connection to said power input terminals of said programming devices, said programming switch selectively connecting its power input terminal to one of its power output terminals;

b. a time delay capacitor for connection to said power reset input of said computer device;

c. a charge-discharge circuit having first and second terminals, said second terminal being connected to said time delay capacitor, said charge-discharge circuit providing a relatively high impedance to current flowing between said first and second terminals in a first direction and a relatively low impedance to current flowing between said second and first terminals in a second opposite direction;

d. and a device respectively connected between each of said power output terminals of said programming switch and said first terminal of said charge-discharge circuit to provide a relatively low impedance to current flowing in said first direction between said output terminals of said programming switch and said first terminal of said charge-discharge circuit;

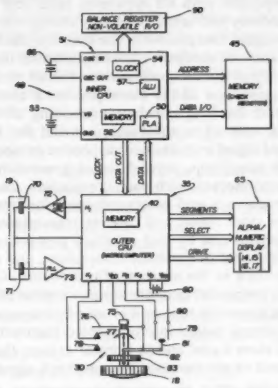
e. whereby said time delay capacitor receives a first charge condition in response to power at one of said power output terminals of said programming switch, and receives a second charge condition in response to the relatively short absence of power at all of said power output terminals of said programming switch.

4,320,387

INFORMATION COMMUNICATING APPARATUS AND METHOD

William S. Powell, Rte. 2, Box 203A, Thornville, Ohio 43076

Continuation-in-part of Ser. No. 974,054, Dec. 28, 1978, abandoned. This application Dec. 19, 1979, Ser. No. 105,403
Int. Cl.[3] H04M 11/00; H04Q 5/00
U.S. Cl. 340—825.34 11 Claims



1. An information communicating apparatus unit comprising

input means selectively operable to generate electrical signals related to a plurality of respective information elements including a fungible information element that are desired to be input into the apparatus for communication with another compatible apparatus unit

display means having a plurality of display elements which are selectively energizaeable in response to input of said information element signals to provide a verifiable display of such information elements,

interface processing circuit means coupled in circuit with said input means for receiving the generated electrical signals and assemble those signals to form a correspondence check signal and coupled in circuit with said display means for effecting a display of said generated signals and being operable to form a correspondence check transmission signal,

signal transmission means coupled with said interface processing circuit means and operable to effect transmission of said correspondence check transmission signal to another of said apparatus units located in relatively remote relationship and to effect receipt of a correspondence check transmission signal from said other apparatus unit, and

switching logic processor circuit means coupled with said interface processing circuit means for receiving said correspondence check signal formed by signal said interface processing circuit means and and a correspondence check signal received from said other apparatus unit via said interface processing circuit means, said logic circuit means including identifier signal generation means selectively operable upon input of said correspondence check signals to form a security identifier signal for the apparatus unit and to include such security identifier signal in the correspondence check signal, signal encoding/decoding circuit means referenced to a time control base and operable to change the security identifier signal for each of successive time base periods, comparison circuit means for effecting a comparison of the correspondence check signals input thereto by said

switching logic processor circuit means coupled with said interface processing circuit means for receiving said correspondence check signal formed by said interface processing circuit means and a correspondence check signal

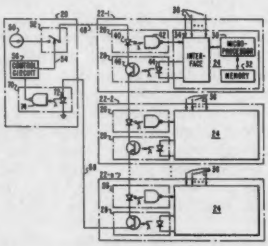
received from said other apparatus unit via said interface processing circuit means, said logic processor circuit means including identifier signal generation circuit means selectively operable upon input of a correspondence check signal from said interface processing circuit means to form a security identifier signal for the apparatus unit and to include such security identifier signal in the correspondence check signal, signal encoding/decoding circuit means referenced to a correspondence signal time base compatible with all apparatus units and operable to sequentially and non-repetitively change the security identifier signal component of the correspondence check signal for each of successive correspondence time periods over the life of the unit, comparison circuit means for effecting a comparison of the correspondence check signals input thereto by said interface processing circuit means and from said other apparatus unit and for forming a compared signal as to each of respective compare or non-compare conditions, second signal generation circuit means interconnected with said comparison circuit means and responsive to said compared signal for forming a transmittable store signal and causing transmission to said other apparatus unit by said interface processing circuit means in the event of a correct comparison, and to terminate the operation in the absence of comparison for assuring that only reciprocal fungible signal components are honored in each apparatus unit, and proof of possession register memory circuit means interconnected therewith to respond to said store signal and to register at least the fungible component of the correspondence check signal.

4,320,388

TWO WIRE OPTICAL DATA COMMUNICATION SYSTEM

Charles C. McCarthy, Baltimore; Mark E. Ackman, Cockeysville, both of Md.; Wayne L. Dufek, North Hopewell, Pa., and Edward E. Kopicky, Bel Air, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 15, 1980, Ser. No. 168,998
Int. Cl.³ H04Q *9/00*; H03K *3/42*
U.S. Cl. 340—825.54 **7 Claims**



1. A data communication system comprising:

(a) a control station including means to request information from a remote station by transmitting a predetermined code over a first single wire, to said remote station, and being operable to receive information transmitted from a remote station over a second single wire;

(b) at least one remote station operable to receive a request for information from said control station and for providing said requested information;

(c) said remote station including data processing means and a receiving opto-isolator having: (i) an optical transmitter element for receiving and passing an electrical signal transmitted from said control station over said first single wire, for transmitting an optical signal in response to said electrical signal; and (ii) a detector for detecting said optical signal to provide an output signal indicative thereof to said data processing means;

(d) said remote station also including a transmitting opto-isolator having: (i) an optical transmitter element for transmitting an optical signal in response to an electrical signal governed by said data processing means; and (ii) a detector for detecting said last named optical signal for allowing electrical signals to be passed by said last named detector;

(e) said optical transmitter element of said receiving opto-isolator being connected in series circuit arrangement with said detector of said transmitting opto-isolator such that the electrical signal through said series connected transmitter element is modulated by said detector;

(f) said control station including receiver means; and

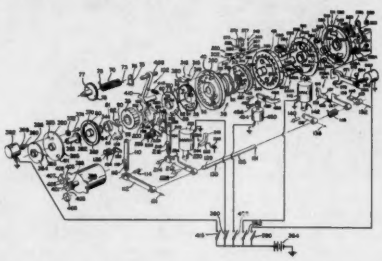
(g) means for providing said modulated signal to said receiver means over said second single wire.

4,320,389

ELECTROMECHANICAL DECODER

Peter J. Caruso, Wayne, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Dec. 4, 1963, Ser. No. 328,083
Int. Cl.³ H04Q *1/00*
U.S. Cl. 340—825.3 **30 Claims**



1. A decoder mechanism comprising a code wheel assembly including

a first wheel element and a second wheel element,

a main code post means normally positioned for locking the first and second wheel elements in driving relation,

selectively operable means for actuating the main code post means in a predetermined sense for unlocking the first and second wheel elements,

auxiliary code post means effective upon the first and second wheel elements being in an unlocked relation,

said auxiliary code post means being operable by said selectively operable means in one sense for locking said first and second wheel elements and in another sense to retain said first and second wheel elements in said unlocked relation,

and means actuated by one of the wheel elements for performing a control function upon the first element being retained in said unlocked relation with the second element.

4,320,390

HIGH RESOLUTION ANALOG TO DIGITAL CONVERTER

Larkin B. Scott, Fort Worth, Tex., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 5, 1978, Ser. No. 922,147
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 NT **8 Claims**

1. A high resolution analog to digital converter circuit for measuring the level from an unknown analog source comprising, in combination:

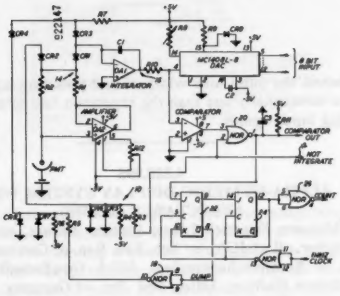
an integrator circuit coupled to the unknown source for producing an integral signal at its output whose magnitude

is the integral of the analog signal provided by the unknown source;

actuator means coupled to said integrator to actuate said integrator circuit for producing said integral signal for a fixed period of time;

comparator circuit coupled to compare said integral signal with a preset level and to produce a compare signal when said integral signal equals said preset level;

reverse polarity dump circuit means coupled to said integrator circuit and responsive to said compare signal to introduce to the input of said integrator for a preset time a constant signal of opposite polarity to that from the unknown analog source;



counter means responsive to said compare signal to count the occurrences of said compare signal while said integrator circuit is actuated; and

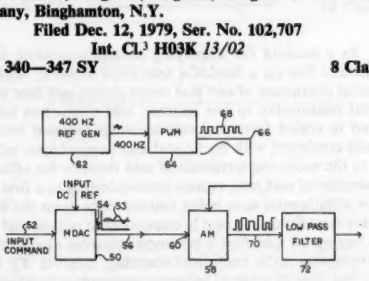
interpolar circuit means operative just preceeding actuation of said integrator circuit to produce a digital beginning representation corresponding to the level of the output of said integrator circuit prior to its actuation and operative just after said fixed period of time has elapsed to produce a digital ending representation corresponding to the level of the output of said integrator circuit, the number in said counter means and the difference between said beginning and said ending representation comprising data for determining a digital representation of the unknown signal.

4,320,391

INSTRUMENTATION DEVICES USING SYNCHRO-RESOLVER DRIVE CIRCUITRY

John H. Mallett, Brighton, England, assignor to The Singer Company, Binghamton, N.Y.

Filed Dec. 12, 1979, Ser. No. 102,707
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 SY **8 Claims**



1. Circuitry for driving a resolver coil comprising:

means for receiving and combining a DC reference voltage and an input command signal, and for providing a DC referenced command signal, said DC referenced command signal being a variable DC signal having a first selected level which varies in response to said input command signal;

means for providing an AC reference signal having a selected amplitude and a selected frequency;

a modulator for providing a pulse width modulated square wave output, said square wave output having a selected frequency substantially greater than said selected frequency of said AC reference signal, and said square wave output further being pulse width modulated by said AC reference signal;

an amplitude modulator for receiving and combining said pulse width modulated square wave and a selected DC referenced command signal to provide a drive signal, said drive signal comprising said pulse width modulated square wave which is further amplitude modulated by said selected DC referenced command signal; and

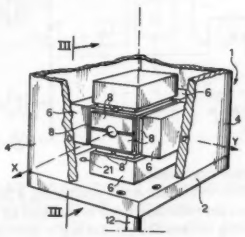
a lowpass filter for receiving said drive signal and for passing substantially only those frequencies no greater than said selected frequency of said AC reference signal to provide a filtered AC drive signal which is amplitude modulated according to said selected DC referenced command signal and has a frequency substantially the same as said selected frequency of said AC reference signal.

4,320,392

TRANSDUCER WITH SIX DEGREES OF FREEDOM

Giovanni Giovinazzo, Nichelino, and Piergiorgio Varrone, Pino Torinese, both of Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed Aug. 28, 1980, Ser. No. 182,263
Claims priority, application Italy, Sep. 25, 1979, 68863 A/79
Int. Cl.³ G01P *15/08*
U.S. Cl. 340—365 C **8 Claims**



1. A transducer with six degrees of freedom arranged to generate electrical signals indicative of forces and moments applied to a movable member to which the transducer is connected during use, said transducer comprising:

a rigid casing intended to be connected to the said movable member, the inner surface of the said casing having three pairs of electrically conductive faces, the faces of each pair lying in planes parallel to one another and perpendicular to the planes in which lie the faces belonging to the other pairs;

a rigid body supported within said casing such as to be displaceable with six degrees of freedom relative to the casing; the outer surface of the said body comprising three pairs of faces, the faces of each pair lying in planes parallel to one another and perpendicular to the planes in which lie the faces belonging to the other pairs; each said face of the rigid body facing towards a corresponding one of the said electrically-conductive faces of the inner surface of the casing and being provided with at least two electrically conductive zones which are coplanar with and electrically insulated from one another and which together extend over substantially the whole of said body face; the conductive zones associated with each outer face of said body defining together with the corresponding electrically conductive face of the casing a respective interspace therebetween:

a shaft connected to the said rigid body and passing with clearance through a hole in the casing;

fluid supply means for feeding a dielectric fluid under pressure through the walls of the said casing into each of the said interspaces, the dielectric fluid being constrained to enter each said interspace in a direction substantially orthogonal to the associated electrically conductive face of the casing inner surface whereby the said body is fluidically supported in the said casing, the said conductive zones together with the said electrically-conductive faces of the casing which face towards these zones constituting a plurality of condensers equal in number to the number of said conductive zones, the capacitance of each said condenser being dependent on the distance between the conductive zone and casing face constituting the condenser; and

an electrical connector secured to said casing and operative to provide instantaneous values of the capacitance of each of the said condensors to a detector.

4,320,393

PERSONAL DOSIMETER WITH REMINDER TIME

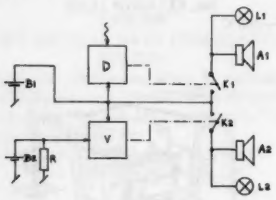
Jean Engdahl, Rue Scholl 39, 2504 Bienne, Canton of Berne, Switzerland

Filed Dec. 19, 1979, Ser. No. 105,192

Claims priority, application Switzerland, Jun. 7, 1978, 6204/78

Int. Cl.³ G08B *21/00*; G01T *1/02*

U.S. Cl. 340—600 **3 Claims**



1. A dosimeter comprising:

means sensitive to radiation for producing a first alarm signal when a certain radiation dose is reached or exceeded; and

time measuring means for producing a second alarm signal when a surveillance period has expired, the second alarm signal being different from the first alarm signal and the expiration of the surveillance period being detected by a drop in voltage occurring at the end of the discharge of an energy source.

4,320,394

FIBER OPTICS LIQUID LEVEL AND FLOW SENSOR SYSTEM

Robert S. John, Jr., Deerfield, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 30, 1979, Ser. No. 98,957

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—618 **3 Claims**

1. A fiber optics sensor system for use with a remote sensor device which interrupts a light path between the ends of a fiber optic cable, said system comprising, in combination:

first means for generating pulsating input signals;

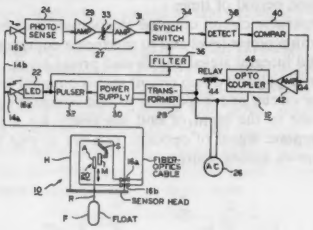
second means for generating light in response to said input signals and said second means having an output optically coupled to one end of said cable;

means coupled to the other end of said cable for detecting pulses of light;

means coupled to the detecting means for providing an output signal in response to said first means;

means coupled to the output signal means for controlling an external utilization device;

means responsive to said first means for selectively detecting said pulsating input signals during a time period which is synchronized with the duration of said pulsating input signals; and,



wherein the pulse time width of said pulsating input signals is substantially less than the repetition rate of said pulsating input signals.

4,320,395

ALPHA-NUMERIC-DISPLAY SYSTEM WITH SELECTABLE CRAWL

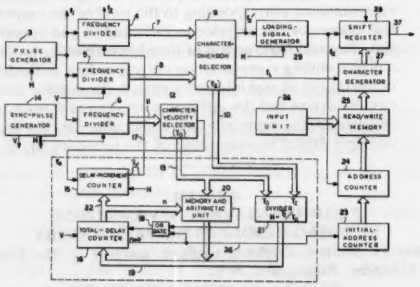
Ralf Meissen; Friedrich Löser; Joachim Berwix, and Christof Krischer, all of JUM/u/ lich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Mar. 10, 1980, Ser. No. 128,521

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1979, 2909660

Int. Cl.³ G09G *1/16*

U.S. Cl. 340—726 **10 Claims**



1. In a method for displaying an alpha-numeric text in a horizontal line on a face of a television monitor, wherein sequential characters of said text move across said face in a fixed spatial relationship to one another, said characters being prestored in coded form and subsequently decoded into binary signals combined with horizontal and vertical sync pulses and fed to the receiving terminals of said monitor for effectuating the display of said text, signals corresponding to a first character in a horizontal scan being emitted only upon the elapse of a delay time following said horizontal sync pulses, said characters having on said face a common apparent character width correponding to a horizontal-scanning interval T_Z substantially less than an interval between consecutive horizontal sync pulses, the improvement comprising the steps of:

generating a frequency f_G which is at least equal to the reciprocal of said interval T_Z; and

successively decreasing, upon said vertical sync pulses, said delay time by an increment T_G to implement motion of said characters across said face, said increment T_G being equal to the period of said frequency f_G and

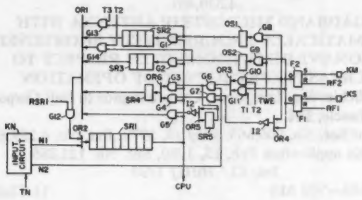
controlling said width by application of a horizontal sam-

pling frequency f_Z whose period is equal to said interval T_Z, said frequency f_G being an integral multiple of said sampling frequency f_Z.

4,320,396
NUMERICAL VALUE INPUT DISPLAY

Ichiro Sado, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1980, Ser. No. 169,091
Int. Cl.³ G06F *3/14*
U.S. Cl. 340—799 **11 Claims**

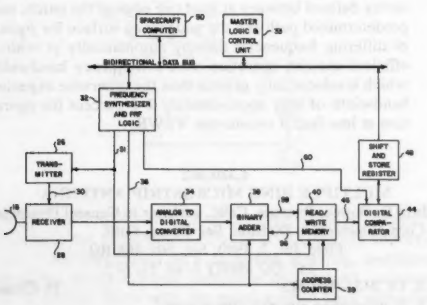


1. Numerical value input display apparatus comprising numerical value input means for entering numerical values; unit input means for entering a unit for designating the place of a first numerical value; memory means for storing the first numerical value entered by the operation of said numerical value input means, taking up the place for said entered first numerical value correspondingly to the place of the unit entered by the operation of said unit input means, and storing at a column less significant than said place a particular code for storing a second numerical value to be entered after entry of said first numerical value; and display means for effecting a display of the first numerical value in a first display form and a display correspondingly to said particular code stored in said memory means in a display form different from the first display form of said first numerical value.

4,320,397
ECHO TRACKER/RANGE FINDER FOR RADARS AND SONARS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Nick J. Constantinides, Pasadena, Calif.

Filed Jun. 29, 1979, Ser. No. 53,572
Int. Cl.³ G01S *13/12*
U.S. Cl. 343—7.5 **16 Claims**

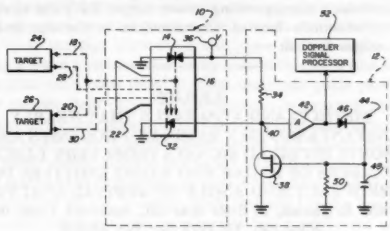


1. An echo tracker/ranging system comprising:
means for transmitting a plurality of pulses having a predetermined pulse repetition frequency (PRF);
means for receiving pulses reflected from an object whose range is to be measured, each reflected pulse being created by one of said transmitted pulses;
means for dividing an interpulse time interval defined by adjacent transmitted pulses into a predetermined plurality of time increments;
means for measuring the amplitude of each reflected pulse portion occurring during each of said predetermined plurality of time increments;
means for identifying which of said predetermined plurality of time increments contains a reflected pulse portion having the greatest amplitude, said identified time increment defining the arrival time of the reflected pulse being measured; and
means for altering said PRF so that said reflected pulse arrival times divide said interpulse time intervals into two portions having a predetermined ratio with respect to each other, said altered PRF being related to the range of said object.

4,320,398
MINIMIZING HARMONIC DISTORTION APPARATUS

Jack D. Fritzlen, P.O. Drawer D, Minturn, Colo. 81645

Filed Jun. 13, 1980, Ser. No. 159,044
Int. Cl.³ G01S *13/58*
U.S. Cl. 343—8 **7 Claims**



1. An apparatus for minimizing harmonic distortion in the output of a microwave circuit, comprising:
microwave circuit means for minimizing harmonic distortion when at least two Doppler signals are outputted therefrom at substantially the same time, said microwave circuit means including first means for transmitting a first signal and second means for receiving second signals reflected by objects in the path of the first signal and for producing Doppler signals using each of the second signals and said first signal; and
means responsive to said second means for generating a control signal corresponding to the maximum in amplitude Doppler signal, said microwave circuit means being responsive to the control signal so that the amplitude of each of the Doppler signals is adjustable such that harmonic distortion of the Doppler signals is minimized.

4,320,399
MICROWAVE PULSE SPECTRUM CONTROL

Daniel C. Buck, Anne Arundel, and Gregory K. Sinon, Laurel, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

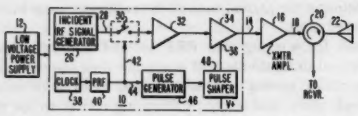
Filed Oct. 9, 1980, Ser. No. 195,551
Int. Cl.³ G01S *7/32*
U.S. Cl. 343—17.1 R **10 Claims**

1. In a solid-state pulsed radar transmitter including an RF signal generator, a PRF timing signal generator, a gating means governed by the generated PRF timing signals to gate the generated RF signal into a train of rectangularly shaped envelope pulses having discontinuities in the rise and fall edges thereof, and a plurality of amplification stages for amplifying

the pulsed RF signals prior to transmission thereof, the improvement comprising:

a pulse generator for generating a power supply timing signal in time relationship with the rectangularly shaped envelope pulses of the RF signal;

a solid-state power modulation device having a power input port coupled to the output of one amplification stage of said plurality, a power output port coupled to the input of another amplification stage of said plurality, and a power supply port; and



a pulse shaper coupled between the output of said pulse generator and said power supply port of said power modulation device and operative to pulse a power supply signal supplied thereto and to shape said pulses to have substantially continuously rising and falling edges in cooperation with said power modulation device;

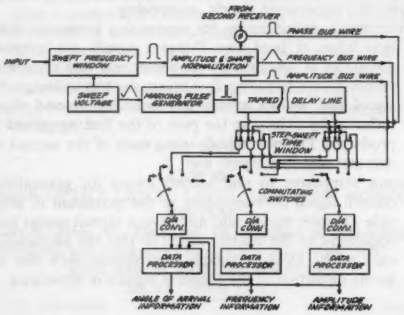
said power modulation device being operative to modulate the power of an input RF pulse envelope in accordance with the shaped power supply signal coupled thereto to render a corresponding power output RF pulse envelope substantially free of discontinuities in the rise and fall edges thereof.

4,320,400

METHOD AND APPARATUS THAT NEARLY INSTANTANEOUSLY SAMPLES, PROCESSES AND SORTS RECEIVED SIGNALS FROM VERY LARGE NUMBERS OF RADAR AND RADIO EMITTERS FOR FREQUENCY AND ANGLE OF ARRIVAL ANALYSIS

Norman E. Chasek, 24 Briar Brae Rd., Stamford, Conn. 06903

Filed Oct. 12, 1979, Ser. No. 84,410
Int. Cl.³ H04B *7/00*
U.S. Cl. 343—100 CL **9 Claims**



1. A receiving system capable of processing signals received from a very large number of radar and radio emitters so as to provide simultaneous indications from which such signal parameters as frequency, angle of arrival, signal strength and/or pulse width can be determined, is comprised of,

a multiplicity of directional antennas with suitably overlapping radiation patterns,

a multiplicity of matched receiver converters, including a rapidly swept frequency window that samples all signals received by said antennas,

a multiplicity of matched RF signal processors that compresses said samples to have a nearly constant output amplitude, with minimal phase shift as a function of signal input amplitude, and to also generate logarithmic signal strength indicating samples from said signals,

a multiplicity of matched video processors that convert said RF samples into video samples that are useful for frequency and angle of arrival indications,

a multiplicity of step-swept time windows which further samples and holds all said video samples, separating them onto individual bus lines, depending on each sample's time position in the frequency sweep cycle, and

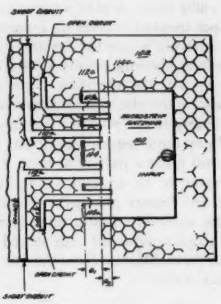
a multiplicity of commutating switches, one commutating switch being assigned for each parameter being indicated.

4,320,401

BROADBAND MICROSTRIP ANTENNA WITH AUTOMATICALLY PROGRESSIVELY SHORTENED RESONANT DIMENSIONS WITH RESPECT TO INCREASING FREQUENCY OF OPERATION

Frank J. Schiavone, Longmont, Colo., assignor to Ball Corporation, Muncie, Ind.

Division of Ser. No. 906,665, May 16, 1978, Pat. No. 4,259,670.
This application Feb. 15, 1980, Ser. No. 121,885
Int. Cl.³ H01Q *1/38*
U.S. Cl. 343—700 MS **11 Claims**



1. An improved microstrip antenna of the type which includes a resonant-dimensioned conductive radiator patch closely spaced over an underlying conductive surface and otherwise normally exhibiting a narrow VSWR bandwidth of only approximately 2–5%, said improved antenna comprising:

a plurality of frequency responsive impedance means connected to the radiator patch at predetermined locations along a predetermined path to automatically and progressively change the effective resonant dimensions of the cavity defined between at least one edge of the patch, said predetermined path and the underlying surface for signals of differing frequencies thereby automatically providing efficient antenna operation over a frequency bandwidth which is substantially greater than the otherwise expected bandwidth of only approximately 2–5 percent for operation at less than a two-to-one VSWR.

4,320,402

MULTIPLE RING MICROSTRIP ANTENNA

Edwin D. Bowen, Ramona, Calif., assignor to General Dynamics Corp./Electronics Division, San Diego, Calif.

Filed Jul. 7, 1980, Ser. No. 166,102
Int. Cl.³ H01Q *1/38, 13/18*
U.S. Cl. 343—700 MS **11 Claims**

1. A microstrip antenna comprising:

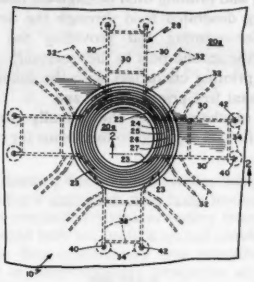
a first sheet made of a dielectric material and having an upper surface and a lower surface;

a plurality of concentric, spaced apart radiating rings made of an electrically conductive material overlying the upper surface of the first dielectric sheet;

RF feedline means overlying the lower surface of the first dielectric sheet for conducting RF signal energy to/from the rings;

means for providing direct electrical connections between the rings and the RF feedline means;

a second sheet made of a dielectric material and having an upper surface and a lower surface, the upper surface of the second dielectric sheet being adjacent to the lower surface of the first dielectric sheet;



a lower ground plane layer made of an electrically condutive material overlying the lower surface of the second dielectric sheet; and

the rings being dimensioned so that the passband of each one of the rings bounded by approximately 3.0 decibel downpoints overlaps a portion of the passband of an adjacent one of the rings bounded by approximately 3.0 decibel downpoints.

4,320,403

USE OF METALLIZED SHEET-FORM TEXTILE MATERIALS AS REFLECTION AND POLARIZATION CONTROL MEDIA FOR MICROWAVES

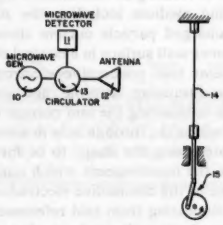
Harold Ebneth, Leverkusen, and Hans-Georg Fitzky, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 30, 1979, Ser. No. 89,712

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847485

Int. Cl.³ H01Q *19/195*

U.S. Cl. 343—756 **10 Claims**



1. In a method of reflecting microwave and high frequency radiation in the range of from 0.01 to 1000 GHz, the improvement comprising using as a reflecting material, metallised sheet-form textile material composed of synthetic polymers and/or natural fibers with the metal applied after activation thereof with a total metal layer thickness of from 0.02 to 2.5 μm by currentless wet-chemical deposition and varying the degree of polarisation of the reflected radiation by one of mono-axial or bi-axial stretching of the sheet-form textile material.

4,320,404

MICROWAVE PHASE SHIFTER AND ITS APPLICATION TO ELECTRONIC SCANNING

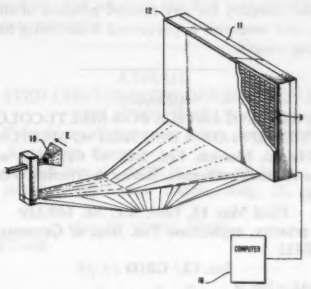
Claude Chekroun, Bures Sur Yvette, France, assignor to Societe d'Etude du Radant, Orsay, France

Continuation of Ser. No. 971,546, Dec. 20, 1978. This application Feb. 24, 1981, Ser. No. 237,642

Claims priority, application France, Dec. 20, 1977, 77 38354

Int. Cl.³ H01Q *3/26*

U.S. Cl. 343—854 **10 Claims**



7. A three dimensional electronic scanning antenna comprising in one plane several phase shifters which are each illuminated by an incident microwave, said phase shifters each comprising a wave guide terminated by a short circuit, a plurality of metallic conductors fitted in shunt along said guide parallel to the electric field vector of said incident microwave, and a plurality of diodes mounted in series and in the same sense on at least selected ones of said conductors; said conductors of each phase shifter being commanded individually by a command bias voltage, forward or reverse, by means of a computer as a function of the pointing angle desired for the emitted microwave beam; and said conductors being positioned with respect to said short circuit of said wave guides to alter the effective length of said wave guides and selectively shift the phase of said incident electromagnetic wave from 0 to 360 degrees by elementary steps of about 10 degrees or less, as a function of the bias supplied to said diodes.

4,320,405

WRITING DEVICE FOR RECORDERS, MEASURING INSTRUMENTS AND THE LIKE

Paul Freude, Duren-Birgel, Fed. Rep. of Germany, assignor to DIA-Nielsen GmbH Zubehör für die Messtechnik, Duren, Fed. Rep. of Germany

Filed Nov. 7, 1979, Ser. No. 92,224

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 7835494[U]

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 A **7 Claims**

1. A writing device for recording or measuring equipment, which includes means for holding a replaceable writing device by the ink reservoir thereof, said writing device comprising:

an ink reservoir (4,14,19) having a vent aperture (5) and shaped to fit into said holding means;

a pen (2,15,20) extending from and carried by said reservoir and having a tip (3,16,21) of ink-permeable material; and

a plug (6) for sealing said vent aperture when said device is not in use, said aperture being so located in a portion of said reservoir fitting said holding means that when said plug is fitted in said aperture to seal said aperture, said plug interferes with said holding means of said equipment and prevents said reservoir from being held in said holding means, said plug having a shaft (8) fitting said aperture and a grip portion (7) connected thereto and extending radially beyond the circumference of said shaft entirely thereabout whereby for any rotated position of the inserted plug, said reservoir is prevented from being held in said holding means.

4,320,406

INK PRINTING DEVICE FOR MULTI-COLORED PRINTING OF A RECORDING MEDIUM

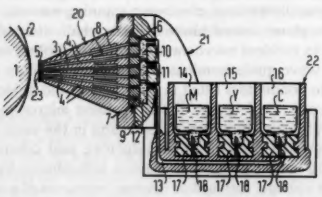
Joachim Heinzl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 13, 1980, Ser. No. 149,319

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1979, 2925812

Int. Cl.³ G01D 15/18

U.S. Cl. 346—140 R 11 Claims



1. An ink printing unit for multi-colored printing of a recording medium comprising a printer head with a plurality of groups of plural printing jets from which ink is ejected onto the recording medium, a plurality of ink reservoirs containing inks of different colors and means for fluidly connecting each of said ink reservoirs exclusively with a respective group of plural printing jets.

4,320,407

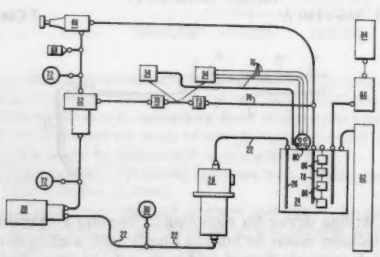
FLUID PUMP SYSTEM FOR AN INK JET PRINTER

Alexander Goldis, Southfield; Kenneth R. Sellen, Dearborn Heights, and Eugene F. Banka, Livonia, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 19, 1980, Ser. No. 150,731

Int. Cl.³ G01D 15/18

U.S. Cl. 346—140 R 12 Claims



1. A fluid pump system for an ink jet printer apparatus comprising:

a reservoir of printing fluid;

filter means for removing virtually all particulate contaminants from the printing fluid;

deaeration means for receiving the printing fluid, separating the fluid into an aerated fluid component and a deaerated fluid component, where the aerated component is substantially larger than the deaerated component, and transmitting deaerated fluid through a first port and aerated fluid through a second port;

a gear pump delivering steady, stable fluid pressure for pumping said printing fluid through the deaeration means, providing deaerated fluid through the first port to the means for printing and providing the aerated fluid through the second port to the reservoir;

means for printing characters with the deaerated virtually contaminant free printing fluid; and

means for regulating when the virtually contaminant free printing fluid is supplied to the means for printing.

4,320,408

METHOD OF FORMING ELECTROSTATIC IMAGE

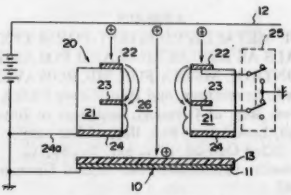
Masakazu Iwasa; Hisashi Katou, both of Odawara, and Satoru Honjo, Asaka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 3, 1979, Ser. No. 81,530

Claims priority, application Japan, Oct. 6, 1978, 53/123265; Dec. 13, 1978, 53/154739

Int. Cl.³ G03G 15/044; H01J 61/06; G01D 15/06

U.S. Cl. 346—159 12 Claims

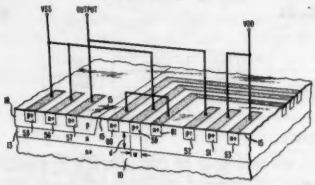


1. In a method of forming an electrostatic image on an electrostatic recording medium including the steps of passing image forming charged particle current through a through hole having an inner wall surface in a control electrode assembly having at least two conductive electrodes interposing therebetween an insulating material and surrounding the through hole and modulating the said current with an electric field established within the through hole in accordance with an image signal representing the image to be formed on the recording medium, the improvement which comprises (a) connecting a first one of the conductive electrodes to a reference voltage and disconnecting from said reference voltage a second one of the conductive electrodes so that a portion of the image forming charged particles establish said electric field in a first direction in the through hole to thereby facilitate the flow of the remaining image forming charged particles through the through hole or (b) connecting said second one of the conductive electrodes to said reference voltage and disconnecting from said reference voltage the first one of the conductive electrodes so that a portion of the image forming charged particles establish said electric field in the through hole in a direction substantially opposite to said first direction to thereby inhibit the flow of the remaining image forming charged particles through the through hole.

4,320,409
COMPLEMENTARY FIELD-EFFECT TRANSISTOR INTEGRATED CIRCUIT DEVICE

Masakazu Shoji, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 1, 1980, Ser. No. 145,611
Int. Cl.³ H01L *27/02*
U.S. Cl. 357—42 **7 Claims**



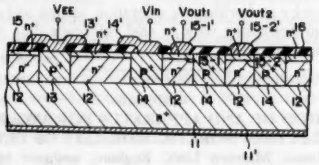
1. A complementary field-effect transistor integrated circuit device comprising a semiconductive body having a first bulk region of a first conductivity type extending from a surface of the body; a second bulk region of a second conductivity type opposite to the first conductivity type extending from the surface; a pair of complementary transistors adjacent to the surface, one of the pair having spaced source and drain of the first conductivity type situated in the second bulk region, the other of the pair having spaced source and drain of the second conductivity type situated in the first bulk region; a relatively heavily doped first guard region of the second conductivity type adjacent the surface in the first bulk region interposed between the pair of transistors; and/or a relatively heavily doped second guard region of the first conductivity type adjacent the surface in the second bulk region and interposed between the pair of transistors;

characterized in that there are included surface means associated with each of the first and second guard regions for reducing any electric fields in the bulk region underlying the guard region.

4,320,410
GAAS SEMICONDUCTOR DEVICE

Jun-ichi Nishizawa, and Tadahiro Ohmi, both of Sendai, Japan, assignors to Semiconductor Research Foundation, Sendai, Japan

Filed May 3, 1979, Ser. No. 35,460
Claims priority, application Japan, May 8, 1978, 53/54270
Int. Cl.³ H01L *27/02*
U.S. Cl. 357—43 **2 Claims**



1. A GaAs semiconductor device comprising:

an n type GaAs substrate of relatively low resistivity having a first main surface;

an n type GaAs layer of relatively high resistivity grown on the first main surface of the substrate and having a second main surface;

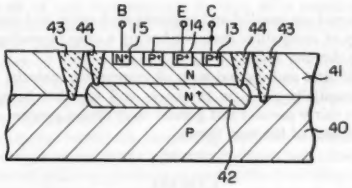
an n type GaAs surface layer of relatively low resistivity grown on at least a part of the second main surface of the n type GaAs layer and having a third main surface; and

a plurality of p type regions formed to extend through the n type GaAs layer and the n type GaAs surface layer, wherein the plurality of p type regions includes at least one pair of adjacent p type regions, wherein a lateral transistor is formed through utilization of the n type GaAs layer defined between the pair of p type regions, wherein one of the pair of p type regions has a portion adjacent the n type GaAs layer and the n type GaAs surface layer, whereby a vertical unipolar transistor is formed through utilization of the substrate, the n type GaAs layer, the n type GaAs surface layer and said p type region, wherein there is included an insulating electrode structure formed on the n type GaAs layer defined between the pair of p type regions, and wherein the first transistor is an insulated gate transistor.

4,320,411
INTEGRATED CIRCUIT WITH DOUBLE DIELECTRIC ISOLATION WALLS

Toshitaka Fukushima, Yokohama, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 24, 1979, Ser. No. 69,349
Claims priority, application Japan, Aug. 25, 1978, 53-116318[U]
Int. Cl.³ H01L *27/04*
U.S. Cl. 357—50 **18 Claims**



1. A semiconductor integrated circuit comprising:

a semiconductor substrate of a first conductivity type;

a buried layer, of a second conductivity type, formed on a portion of said semiconductor substrate;

an epitaxial layer, of said second conductivity type, formed on said buried layer and formed on the portion of said semiconductor substrate upon which said buried layer is not formed;

a dielectric isolation region which encloses a first portion of said epitaxial layer and which extends from a surface of said epitaxial layer to said semiconductor substrate, said dielectric isolation region comprising a groove;

an insulative leakage current blocking region which encloses a second smaller portion of said epitaxial layer inside said first portion, and which extends from the surface of said epitaxial layer to said buried layer, said insulative leakage current blocking region comprising a groove; and

a lateral semiconductor device formed in said second portion of said epitaxial layer enclosed by said insulative leakage current blocking region, said lateral semiconductor device comprising spaced regions of said first conductivity type.

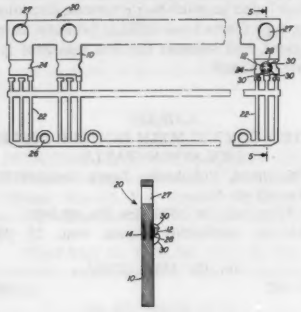
4,320,412
COMPOSITE MATERIAL FOR MOUNTING ELECTRONIC DEVICES

Roger P. Hynes, Union County, N.J., and Karl A. Stackhouse, Northampton County, Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Continuation of Ser. No. 809,211, Jun. 23, 1977, abandoned. This application Jan. 29, 1980, Ser. No. 116,418
Int. Cl.³ H01L *23/48, 29/44, 29/52*
U.S. Cl. 357—70 **2 Claims**

1. A lead frame for mounting a semiconductor chip which comprises:

(a) a strip of copper material;
(b) first and second strips of compatible material comprised of an alloy of principally iron, nickel and cobalt in proportions by weight of about 53.5%, 29%, and 17.5% respectively, said first and second strips inlaid on opposite sides of a portion constituting less than all of said copper material such that said first and second strips of compatible



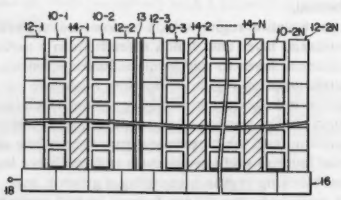
material are parallel and opposite each other and said first strip of compatible material having a chip mounting portion therein; and
(c) said first and second strip of compatible material being substantially equal in thickness and together being less than thirty percent and greater than fifteen percent of the thickness of the lead frame.

4,320,413

SOLID-STATE IMAGE PICK-UP DEVICE

Yasuo Takemura, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 30, 1980, Ser. No. 192,475
Claims priority, application Japan, Sep. 4, 1979, 54-127275; May 15, 1980, 55-63355; May 15, 1980, 55-63356
Int. Cl.³ H04N 3/15
U.S. Cl. 358—44 **5 Claims**



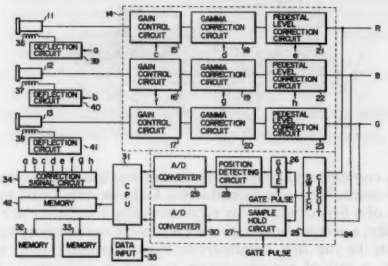
1. A solid-state image pick-up device comprising:
a plurality of image pick-up portions two-dimensionally arranged with intervals, each including a plurality of photoelectric converting elements arranged in a line;
a plurality of overflow drains disposed on every other interval to absorb excessive charges overflown from said image pick-up portions;
a plurality of charge transfer portions which are disposed two for each interval having no overflow drain and each having electrodes corresponding to the photoelectric converting elements of said image pick-up portion adjacent thereto to serially transfer charges parallel transferred from said image pick-up portions; and
a second charge transfer portion connected to one end of each said first charge transfer portion to serially transfer charges parallel transferred from said first charge transfer portions.

4,320,414

ADJUSTING DEVICE FOR COLOR TELEVISION CAMERA APPARATUS

Yoshimori Miyaji, Tokyo; Hirokazu Fujiki, Asakusabashi, and Fumio Takahashi, Inagi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 8, 1980, Ser. No. 138,556
Claims priority, application Japan, Apr. 27, 1979, 54-52326
Int. Cl.³ H04N 9/09
U.S. Cl. 358—51 **9 Claims**



6. An adjusting device for a television camera apparatus which comprises:
(a) a signal processing section for processing Red (R), Blue (B) and Green (G) video signals which indicate a test pattern having a gray scale, reference marker and rotation detection marker,
(b) a data detecting section for receiving video signals from said signal processing section and detecting reference data including gray scale data and marker data,
(c) an arithmetic operation section for calculating correcting data from said gray scale data and marker data detected by said data detecting section and reference gray scale data and marker data,
(d) a correcting signal circuit for converting said correcting data calculated by said arithmetic operation section into a correcting signal and supplying said correcting signal to said signal processing section and a deflection circuit,
(e) a manual correcting data generating means for manually issuing manual correcting data used to correct adjustment errors inherently occurring in said television camera apparatus, and
(f) a memory section having at least a non-volatile memory for storing said manual correcting data and storing either one of said reference data and said calculated correcting data as reference data during loss of power to said memory section,
whereby said arithmetic operation section adds said manual correcting data to said reference data to provide adjusting data.

4,320,415

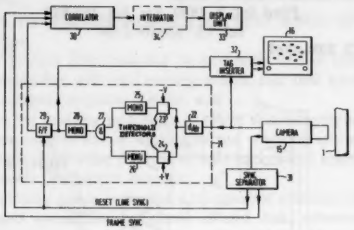
METHOD OF AND APPARATUS FOR MEASURING ELECTROPHORETIC MOBILITY OF CELLS

Robin Jones, Malvern Link, England, assignor to National Research Development Corporation, London, England

Filed Jun. 5, 1980, Ser. No. 156,798
Claims priority, application United Kingdom, Jun. 14, 1979, 20672/79
Int. Cl.³ H04N 7/18
U.S. Cl. 358—105 **6 Claims**

1. A method of measuring electrophoretic mobility of cells comprising the steps of applying an electric potential to a solution in an electrophoretic chamber, scanning a portion of the chamber in a line by line manner to provide a first image frame, processing each line of scan to provide a digital number representing detected cells in that line and to provide a first set of numbers collectively representing the first image frame,

scanning and processing to provide a second set of numbers representing a second image frame a time τ later, cross correlating the two sets of numbers to determine the image movement in the time τ and hence the cell mobility of a plurality of cells in the solution.

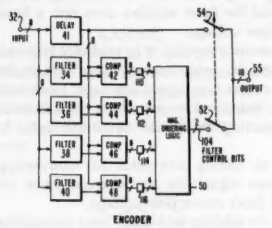


4,320,416

TECHNIQUE FOR OPTIMALLY ENCODING DIGITALLY ENCODED VIDEO SIGNALS

Robert A. Dischert, Burlington; Eugene M. Nagle, Middletown, and James J. Williams, Jr., Plainsboro, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 15, 1980, Ser. No. 197,290
Int. Cl.³ H04N 7/12
U.S. Cl. 358—133 **18 Claims**



1. A method of transmitting data divided into first and second portions, each portion comprising a plurality of bytes, said method comprising transmitting said first portion, comparing at least one byte of the remaining untransmitted second portion to a plurality of selected combinations of bytes of said first portion, determining which of said selected combinations of bytes of said first portion is the closest match to said one byte of said second portion, transmitting a control byte indicative of said closest match if there is only one combination which is the closest match; and

transmitting a control byte indicative of a selected combination in a selected priority order if there is a tie for said closest match.

4,320,417

AUTOMATIC FOCUSING SYSTEM FOR VIDEO CAMERA

Kentaro Hanma, Yokohama, and Kaoru Yanagawa, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1980, Ser. No. 193,455
Claims priority, application Japan, Oct. 3, 1979, 54-126850
Int. Cl.³ H04N 3/26
U.S. Cl. 358—227 **5 Claims**

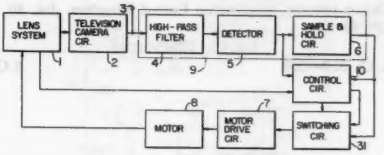
1. An automatic focusing system for a video camera comprising:

(a) a circuit for detecting a focus voltage depending upon a high frequency component in a video signal of a televized scene;

(b) a motor for driving a focusing lens provided in a lens system;

(c) a first closed loop for effecting automatic focusing by driving said motor in the same direction as before when said focus voltage is increasing and reversing the direction of rotation of said motor when said focus voltage turns to decrease;

(d) a second closed loop for positioning said lens through the driving of said motor such that the difference between a lens stop position signal memorized in a first memory and a signal representing the actual position of said lens is reduced to zero;



(e) a first means for calculating a finite number of stop positions of said lens through division of a required focus distance range on the basis of the reduction factor and focal distance of said lens system and according to the depth of field thereof such as to permit televization of a scene in a permissible focus state over said required focus distance range and memorizing said stop positions in a second memory; and

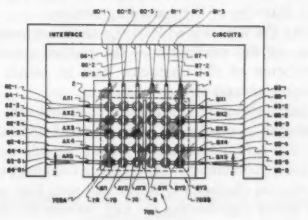
(f) a second means for permitting, when an in-focus state is brought about in the operation of said first closed loop, one of said stop positions closest to the prevailing position of said lens memorized in said second memory to be read out therefrom and written in said first memory while at the same time rendering said first closed loop into an open state and said second closed loop into a closed state.

4,320,418

LARGE AREA DISPLAY

Thomas J. Pavliscak, 2 S 454 Seneca Dr., Wheaton, Ill. 60187

Continuation-in-part of Ser. No. 967,740, Dec. 8, 1978, Pat. No. 4,233,623, which is a continuation-in-part of Ser. No. 788,517, Apr. 18, 1977, abandoned. This application May 13, 1980, Ser. No. 149,415
Int. Cl.³ H04N 3/00, 5/66
U.S. Cl. 358—240 **5 Claims**



1. In a large area A.C. gas discharge display device having an X—Y matrix of light emitting pixels defined by the crossovers of transversely oriented arrays of electrodes, the improvement wherein at least one electrode array is divided into at least two distinct physical portions so as to provide lower electrical resistance per divided electrode line, lower electrical capacitance per discharge cell site along each divided electrode line, and lower electrical current per electrode line thereby reducing the electrical drive requirements of the panel

interface drive circuits and providing more uniform electrical voltage pulses to each of the discharge cell sites along each electrode line.

4,320,419

IMAGE REPRODUCTION EQUIPMENT

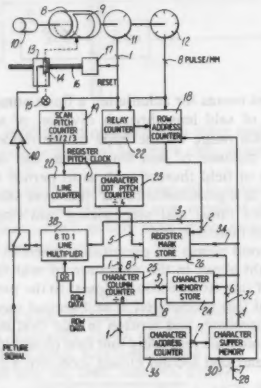
Peter F. Cottriall, London, England, assignor to Crosfield Electronics Limited, London, England

Filed Jul. 29, 1980, Ser. No. 173,411

Claims priority, application United Kingdom, Jul. 30, 1979, 26529/79

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—258 **8 Claims**



1. A method of recording on a single recording sheet, including recording at a first resolution from a source of picture signals and recording at a second and coarser resolution from a source of signals representing dot-matrix characters, comprising the steps of:

storing, for each dot-matrix character to be recorded, data defining a pattern of dots which make up that character;

scanning a recording surface with a recording head in a succession of parallel lines;

generating scan line address signals in synchronism with the line scanning of the recording surface;

dividing the scan line address signals in accordance with the ratio of the resolution of the picture recording to the resolution of the character dots to obtain a character column address signal;

addressing the character data store with a data signal representative of a selected character and with the character column address signal to obtain signals representing a required column of elements, each forming part of a dot of a selected character lying on that scan line, and repeating the signal representing the said column of dot elements in successive scanning lines until the character column address signal is incremented, indicating completion of the dot;

and, during the scanning of the recording surface, applying to the recording head both a signal representing the picture data for the line which is being recorded and a signal derived from the character store in accordance with the said character-selecting signal and character column address signal and representing the dot elements for the required column of a dot of the selected character.

4,320,420

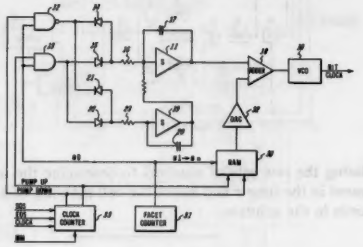
HYBRID BIT CLOCK SERVO

Ronald E. Rider, Palos Verdes Estates, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 3, 1980, Ser. No. 165,813

Int. Cl.³ H04N *1/04*

U.S. Cl. 358—267 **11 Claims**



1. A circuit for individually correcting the bit clock of a spot scanner for each of a plurality of facets of a polygon comprising:

clock counter means for determining whether the clock pulse count for each scan is too high, or too low, and for creating a digital correction signal,

facet counter means for associating each facet with its associated digital correction signal,

first integrating means for transforming the digital correcting signal for facet number zero into a facet zero analog correction voltage;

memory means responsive to said clock counter means and addressed by said facet counter means for storing the digital correction signal for each facet other than facet number zero, and responsive to said facet counter means for outputting the digital correction signal for the current facet,

a digital to analog converter for converting said digital correction signal for the current facet into an analog current facet correction voltage,

an adder for adding said facet zero correction voltage and said current facet correction voltage, and

a clock generator, responsive to the adder output for producing pulses at a corrected frequency.

4,320,421

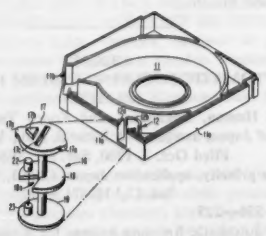
ROTARY ACTUATOR FOR FILE PROTECT FUNCTION

Richard T. Larson, Boulder; David H. McMurtry, and Helfried O. Rinkleib, both of Tucson, all of Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 27, 1980, Ser. No. 153,801

Int. Cl.³ G11B *15/04, 23/02*

U.S. Cl. 360—60 **4 Claims**



1. A file protect device for controlling recording on a mag-

netic recording medium stored in a cartridge, by interfacing with sensing means located in a housing in which said cartridge is mounted, said file protect device comprising

a shaft;

means for rotatably mounting said shaft within said cartridge;

a file protect disk mounted on said shaft and in operative relationship with said sensing means, said disk having an interrupted segment therein, and

means for rotating said shaft to move said interrupted segment relative to said sensing means, whereby said sensing means detects the position of said interrupted segment to effect a file protect function;

said sensing means including a mechanical element which is urged against the periphery of said disk, whereby said mechanical element enters said interrupted segments when said shaft is rotated to position said segment adjacent said mechanical element, including means responsive to the position of said mechanical element to effect a file protect function.

4,320,422

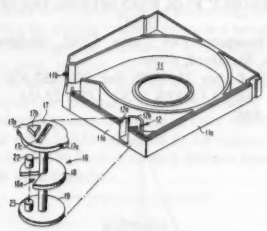
FILE PROTECT SLEEVE

Helfried O. Rinkleib, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 27, 1980, Ser. No. 153,802

Int. Cl.³ G11B *15/04, 23/02*

U.S. Cl. 360—60 **4 Claims**



1. A file protect device for controlling recording on a magnetic recording medium stored in a cartridge, comprising

a sleeve formed in said cartridge, said sleeve having two spaced slots along its length;

a file protect actuator rotatably mounted within said sleeve;

said actuator including an outer disk rotatable with said actuator, said outer disk including protruding stubs spaced apart on the periphery of said outer disk for mating with said slots of said sleeve; and

means for rotating said file protect actuator and said outer disk to enable or disable its file protect function in dependence upon the position of said outer disk in said slots;

one portion of the periphery of said sleeve between said slots being shorter in height than a second portion of said sleeve between said slots, whereby only one of said protruding stubs contacts said sleeve during rotation of said file protect actuator and said outer disk.

4,320,423

APPARATUS FOR AUTOMATIC REPEATED REPRODUCTION OF SOUND ON SELECTED PORTIONS OF MAGNETIC TAPE OR THE LIKE

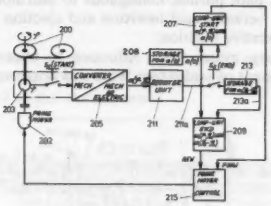
Ernst Frey, Unterägeri, and Alois Aregger, Zürich, both of Switzerland, assignors to Nähma AG, Unterägeri, Switzerland

Continuation-in-part of Ser. No. 780,071, Mar. 22, 1977, abandoned. This application Oct. 23, 1978, Ser. No. 953,756

Claims priority, application Switzerland, Mar. 22, 1976, 3357/76; Fed. Rep. of Germany, Mar. 16, 1977, 2711463

Int. Cl.³ G11B *15/18, 19/06, 17/00*

U.S. Cl. 360—72.2 **20 Claims**



1. Apparatus for effecting single or plural reproduction of intelligence on a selected portion of tape between selected start and end points in a machine wherein intelligence is stored on magnetic tape and which includes rotary means for playing out and collecting the tape, means for driving said rotary means in either direction and means for operating said driving means, said apparatus comprising

detector means for monitoring the momentary position of the tape and for converting the same into a varying physical indication; and

means for controlling the operation of the machine independently from any information recorded on the tape, including

first storing means for storing a first physical value representative of said start point

second storing means for storing a second selected physical value representative of said end point;

at least said second storing means being connected to said detecting means for obtaining said varying physical indication therefrom for storing as said physical value

comparator means coupled to said first and second storing means and to said detector means, said comparator means including means for generating a first control signal for operating the machine in a playback mode when said physical indication matches said first stored value, and means for generating a second control signal for operating the machine in a revived mode when said physical indication matches said second stored value; and

operating means connected to said comparator means and responsive to said first and second control signals for actuating the machine for operation in said modes.

4,320,424

TAPE RECORDER HAVING CASSETTE LOADING APPARATUS

Osamu Murayama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 19, 1980, Ser. No. 131,836

Claims priority, application Japan, Mar. 22, 1979, 54-33452

Int. Cl.³ G11B *5/008, 15/00, 15/18;* **G06K** *13/00*

U.S. Cl. 360—96.5 **6 Claims**

1. A cassette loading apparatus for a front-loading video tape recorder comprising:

cassette support means;

holding means movable relative to said support means be-

tween an insertion and ejection position and an operative position;

said cassette holding means being adapted to accept and hold a cassette inserted therein from a front of the video tape recorder when said holding means is in said insertion and ejection position;

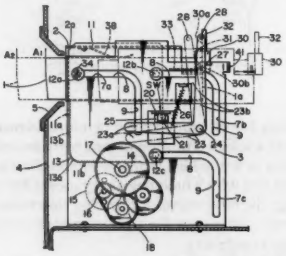
a rack having a horizontal portion and a vertical portion contiguous to said horizontal portion;

a pinion engaging said rack;

one of said rack and pinion being secured to said holding means;

guiding means for guiding said holding means along a substantially horizontal path portion and along a substantially vertical path portion contiguous to said horizontal path portion between said insertion and ejection position and said operative position;

said guiding means being effective to maintain meshing engagement of said pinion with said horizontal and vertical portions of the rack during movement of said holding means along said horizontal and vertical path portions, respectively;



a reversible electric motor for rotating said pinion;

motor control means having first and second conditions for controlling the operation of said electric motor;

means responsive to insertion of said cassette into said holding means for actuating said motor control means to said first condition whereby operation of said motor is effected and movement of said holding means from said insertion and ejection position to said operative position is initiated;

means responsive to arrival of said holding means at said operative position for actuating said motor control means to said second condition whereby further movement of said holding means is there terminated; and

means responsive to return movement of said holding means from said operative position to said insertion and ejection position for again restoring said motor control means to said second condition.

4,320,425

CENTERING AND MOUNTING APPARATUS FOR A MAGNETIC RECORDING DISC

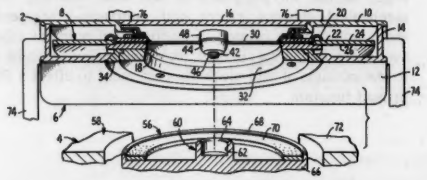
Robert C. Hall, San Francisco, Calif., assignor to Memorex Mini Disc Drive Corporation, Santa Clara, Calif.

Filed Apr. 10, 1980, Ser. No. 138,779
Int. Cl.³ G11B *23/04, 25/04*
U.S. Cl. 360—97 **12 Claims**

1. For a magnetic recording disc, apparatus for removably mounting and rotatably driving such disc by a disc drive, which disc drive includes a rotatably driven spindle having a cylincrically hollow portion with an open outer end centered upon the axis of rotation and a disc hub supporting and drivingly engaging portion spaced radially outwardly from the cylindrically hollow portion, said mounting and driving apparatus comprising

a deflectable member forming a portion of said disc and extending radially inwardly of the recording surface of said recording disc and having an axially resiliently deflectable portion generally adjacent the disc axis,

a centering member coaxially mounted to said deflectable member and extending downwardly of the lower surface thereof and having a generally spherically curved convex surface curving inwardly away from said deflectable member, the spherical radius of said centering member being greater than the internal radius of said spindle cylindrical hollow portion, whereby, when the disc is advanced generally axially toward and into engagement with the spindle, engagement between the centering member and the open outer end of the spindle hollow portion will effect centering of the centering member and thus of the recording disc with respect to the spindle, and



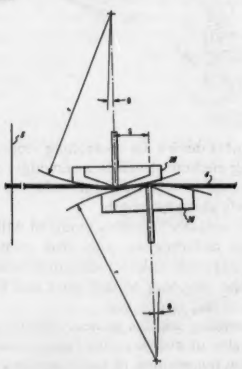
a rigid hub portion positioned radially between the disc recording surface and the deflectable portion of said deflectable member, the lowermost part of said rigid hub portion being positioned such that disc centering member and said spindle cylindrically hollow portion engage one another before said hub supporting and drivingly engaging portion of said spindle and said hub rigid portion drivingly engage one another when said disc is advanced generally axially toward said spindle, whereby the engagement of the centering member and the spindle hollow portion serve to align the disc and spindle coaxially with one another before driving engagement is made between the disc hub and the spindle.

4,320,426

HEAD ASSEMBLY FOR RECORDING ON MAGNETIC DISC

Herbert E. Thompson, Los Gatos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 23, 1980, Ser. No. 152,976
Int. Cl.³ G11B *5/50, 5/54, 21/16*
U.S. Cl. 360—104 **4 Claims**



1. An apparatus for recording data on both sides of a pliant magnetic disc rotating about an axis comprising:

a carriage member,

a contilevered arm supported by said carriage member,

a pair of transducer heads each having a curved surface, a first of said head being supported by said carriage member and the second of said heads being supported by said contilevered arm, said heads being radially spaced from said axis of rotation by different distances when said heads are in the recording position, and

means for urging the curved surfaces of said heads toward each other with a force of sufficient magnitude to cause said heads to penetrate the nominal plane of said disc when said heads are in the recording position whereby said disc is forced to have a wavy contour over said curved surfaces of said heads,

said supports for said heads angling said heads in opposite directions from axes parallel to said axis of rotation of said disc when said heads are in the recording position.

4,320,427
WEAR-RESISTANT MAGNETIC HEADS

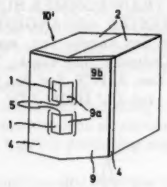
Wolfgang Bogen, Fischerhüttenstrasse 86a, 1000 Berlin 37, Fed. Rep. of Germany

Continuation of Ser. No. 970,641, Dec. 18, 1978, abandoned. This application Aug. 18, 1980, Ser. No. 179,185

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1977, 2756834; Feb. 10, 1978, 2805777

Int. Cl.³ G11B *5/22, 5/42;* **H01F** *7/06*

U.S. Cl. 360—122 **14 Claims**



1. A wear-resistant magnetic head adapted for positioning adjacent a recording carrier, including at least one magnetic core holder and having at least one magnetic core embedded therein, wherein the surfaces of the magnetic core and magnetic core holder are manufactured according to the steps of:

(a) depositing by plasma coating process a metallic, magnetically-conducting first substance to a thickness of at least 0.25 mm over at least the surface of the magnetic core adapted to be adjacent to said recording carrier; and

(b) depositing by plasma coating process a magnetically non-conducting second substance over the surface of said magnetic core holder adapted to be adjacent to said recording carrier to form a unitary surface surrounding said magnetic core surface.

4,320,428
MULTITRACK THIN-FILM MAGNETIC HEAD WITH STACKED ELECTRIC LEADS

Gerardus H. J. Somers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

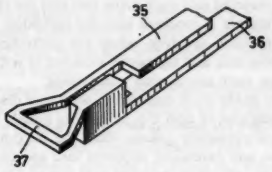
Filed Jan. 21, 1980, Ser. No. 113,846

Claims priority, application Netherlands, Feb. 28, 1979, 7901577

Int. Cl.³ G11B *5/20, 5/16, 5/28, 5/30*

U.S. Cl. 360—123 **5 Claims**

1. A magnetic transducer head destined to be brought in operation, into a magnetic flux-coupling relationship with a magnetic recording medium which for that purpose is moved past the head, the head comprising a substrate which supports a plurality of magnetic transducer elements of the thin-film type, each element being connected by two spatially separated strip-shaped electric leads to two bonding pads, characterized in that said two leads of each element are generally planar and are stacked one on top of the other over the greater part of their length in generally registered relationship with an electrically insulating layer interposed therebetween, the transducer elements being formed by magnetic circuits, each magnetic circuit being coupled to an electric turn to generate a transducing action between magnetic flux in the circuit and a current in the turn, each turn comprising two ends situated in one plane and connected to the electric leads.



4,320,429
PRESSURE DEVICE FOR FLEXIBLE RECORDING MEDIA IN CARTRIDGES USING A UNIVERSAL JOINT MOUNTING

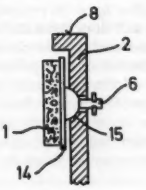
Werner Knerich, Willstätt; Udo Boehm; Klaus Schulze-Berge, both of Ludwigshafen, and Roland Brotzler, Hochdorf-Assenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 17, 1980, Ser. No. 113,096

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1979, 7903031

Int. Cl.³ G11B *15/60*

U.S. Cl. 360—130.34 **3 Claims**



1. A pressure device for flexible recording media contained in cartridges, which comprises a rigid member provided with a resilient pad, which member is arranged on a pivoted arm which can be urged toward a platen portion on the chassis of the drive unit for the recording medium, and is located in front of the write/read area of the scanning head relative to the direction of rotation of the flexible recording medium, and thus presses the recording medium, at least indirectly, against said platen portion, wherein the rigid member is mounted by means of a universal joint, in order to achieve the application of pressure over the entire surface of the resilient pad.

4,320,430
RECORDING DISC CARTRIDGE CLOSURE MECHANISM

Noland E. Vogt, Woodside, Calif., assignor to Memorex Mini Disc Drive Corporation, Santa Clara, Calif.

Filed Apr. 10, 1980, Ser. No. 138,778

Int. Cl.³ G11B *23/02, 5/012, 5/52*

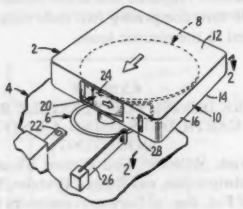
U.S. Cl. 360—133 **7 Claims**

1. For a magnetic recording disc cartridge which is insertable into a drive unit having a closure-actuating probe member which is received into the cartridge upon such insertion, such cartridge including a disc enclosed within a housing having generally planar top and bottom panels and peripheral panels

extending therebetween with an aperture in said peripheral panels for receiving magnetic transducer heads therethrough into the interior of the housing for cooperation with the recording disc therewithin, a selectively openable closure mechanism for selectively opening access to said aperture when the cartridge is inserted into such drive unit and the closure-actuating probe member is received into the cartridge, and for closing access to such aperture when the cartridge is removed from the drive unit and the probe member is withdrawn from the cartridge, such mechanism comprising

an arcuate guide track concentric with said disc and formed in at least one of said top or bottom panels and having a radius of curvature greater than the maximum radius of said disc and extending adjacent said aperture; and

door means extending between said top and bottom panels, said door means including:



at least one arcuate door slidably carried by said guide track for selective movement between a closed position generally covering said aperture and an open position exposing at least a portion of said aperture, and

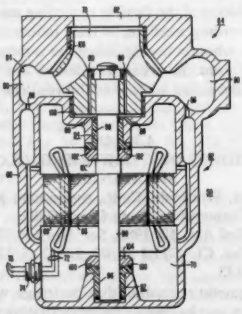
means connected to said door for engaging and capturing said probe member upon its reception into said cartridge and for driving said door from said closed position to said open position and back to said closed position upon insertion and withdrawal of said probe with respect to said cartridge, said capturing means preventing said withdrawal of said probe member from said cartridge except when said door is substantially in said closed position, whereby the door will be positively closed before the cartridge can be removed from the drive unit.

4,320,431

FLUID CIRCULATING PUMP

Clifford J. Bell, Mt. Pleasant, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 26, 1980, Ser. No. 124,687
Int. Cl.³ H02H 7/08
U.S. Cl. 361—23 **7 Claims**



5. A protected motor-pump unit for circulating liquid in a liquid-cooled electrical apparatus, including means for minimizing undesirable dislodging of contaminant particles into the circulating liquid by the motor-pump unit, comprising:

a pump and an electrical motor having a common shaft and disposed in a common housing, the housing including liquid passages for allowing a portion of the liquid passing through the pump to cool the electrical motor, said shaft comprising electrically conductive material;

bearing means comprising electrically non-conductive material and having at least first and second journal bearing surfaces providing support for the shaft in radial and axial directions, respectively;

at least first, second, and third conductive annular members stationarily disposed respectively in said bearing surfaces, said annular members being recessed below the bearing surfaces by a predetermined wear-dimension; and

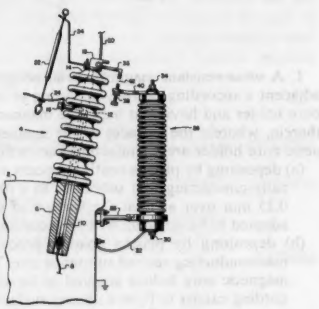
electrical circuit means for detecting when the wear of the bearing means in either of the first and second journal bearing surfaces just exceeds said predetermined wear dimension, enabling the conductive shaft to selectively contact the first and second conductive annular members, said electrical circuit means comprising connections to said first and second annular members, said electrical circuit means being adapted for warning or tripping purposes.

4,320,432

HIGH VOLTAGE TRANSFORMER BUSHING FUSE AND ARRESTER ARRANGEMENT

Clarence G. Duenke, San Angelo, Tex., assignor to San Angelo Electric Service Company, San Angelo, Tex.

Filed Dec. 3, 1979, Ser. No. 99,615
Int. Cl.³ H02H 7/04
U.S. Cl. 361—39 **7 Claims**



1. A transformer high voltage terminal comprising:

a generally cylindrical insulating bushing having a first end for engagement with a transformer housing, an axial passageway extending from said first end to a point spaced from a second end, and a radial passageway extending from an outer surface of said bushing to said axial passageway at said point;

an electrical conductor extending from said bushing first end through said axial and radial passageways;

a high tension line connector carried on said second end of said bushing;

a fuse link connected between said electrical conductor at said radial passageway and said high tension line connector;

said fuse link being mounted on spaced apart pretensioned spring arms, one arm being mounted on said high tension line connector and the other arm being mounted on said electrical conductor;

a spark gap arm mounted on said high tension line connector; and

a lightning arrester having a first end connected to said

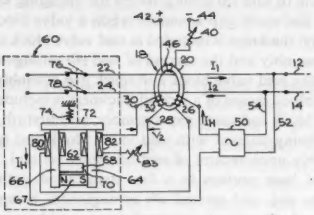
housing and a second end carrying a spark gap terminal spaced from said spark gap arm by a preselected distance.

4,320,433

EARTH-LEAKAGE-CURRENT CIRCUIT BREAKER SYSTEM

Shoichi Yamaki, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1980, Ser. No. 133,498
Int. Cl.³ H02H 3/28
U.S. Cl. 361—45 **10 Claims**



1. A leakage-current-sensitive circuit breaker for a D-C power system having a pair of conductors adapted to carry D-C current in opposite directions, including:

a toroidal, saturable core ringing said pair of conductors;

first and second windings about said core;

a source of alternating current;

a circuit breaker mechanism including a yoke having first and second legs and magnetic means coupled between said first and second legs for producing magnetic flux in said legs;

a first field coil wound in a first direction around said first leg and a second field coil would around said second leg in a direction opposite to said first direction;

a magnetic armature movable from a position in proximity to said yoke to a position remote therefrom;

a pair of switch arms carried by said yoke and movable from a closed position, when said armature is proximate to said yoke, to an open position, when said armature is remote from said yoke;

first biasing means for urging said armature away from said yoke;

said first winding and said first field coil being connected in series across said source of alternating current;

said second winding being coupled across said second field coil;

said first and second field coils producing equal and opposite magnetic fields in the absence of leakage current in said power system;

said core being saturable by a predetermined level of leakage current to cause a reduction in the magnetic field produced by said second field coil, whereby said armature is urged away from said yoke by said first biasing means and said switch arms are moved to an open position.

4,320,434

POWER SEMICONDUCTOR PROTECTION CIRCUIT WITH FAULT DETECTION

Gary L. Stirk, Rocky Mount, Va., assignor to General Electric Company, Salem, Va.

Filed Dec. 10, 1979, Ser. No. 101,783
Int. Cl.³ H02H 7/20, 3/28
U.S. Cl. 361—86 **4 Claims**

1. A protective circuit for a power semiconductor device responsive to an input signal to connect a load to a voltage source comprising:

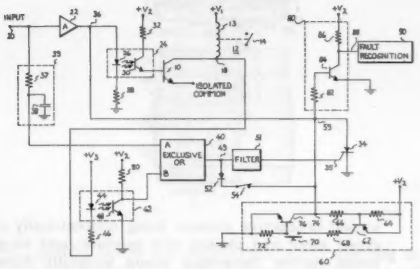
(a) first means responsive to said input signal for effecting a signal operable to render said semiconductor device conductive to thereby connect said load to said voltage source;

(b) second means responsive to a voltage associated with said semiconductor device to develop a condition signal having a first value when said semiconductor device is conducting normally and a second value at all other times;

(c) logic means responsive to a prescribed relationship between said input signal and said condition signal to generate a control signal;

(d) switch means including a gate controlled semiconductor device having an anode, a cathode and a gate electrode responsive to said control signal operative to render said semiconductor device nonconductive; and,

(e) reset circuit means operable to reduce the voltage on said gate controlled semiconductor device anode to a level



sufficient to render said device nonconductive, said reset circuit means including first and second semiconductor switching means,

(1) said first semiconductor switching means normally being biased to the nonconductive state by the voltage on the gate controlled semiconductor device when said gate controlled semiconductor device is nonconductive and being biased to a conductive state when said gate controlled semiconductor device is conductive;

(2) said second semiconductor switching means capable of being rendered conductive to reduce the voltage on the anode of said gate controlled semiconductor device to thereby render that device nonconductive; and,

(3) switch means selectively operable to effect the conduction of said second semiconductor switching means.

4,320,435

SURGE ARRESTER ASSEMBLY

Raymond D. Jones, Cheam, England, assignor to TII Industries, Inc., Lindenhurst, N.Y.

Filed Mar. 6, 1979, Ser. No. 18,360
Int. Cl.³ H02H 3/22
U.S. Cl. 361—119 **29 Claims**

1. An electrical overvoltage arrester assembly for use in a screw-in type station protector for protecting telephone and the like equipment from voltage surges comprising:

(i) a conductive holder adapted and arranged to be threadably engaged in a station protection base;

(ii) a conductive cage element positioned within said holder;

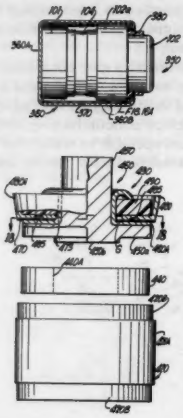
(iii) biasing means disposed between said cage and holder to urge said cage in the direction away from the holder;

(iv) a gas-tube subassembly positioned in said cage including:

(a) a gas-filled housing including two electrodes defining an ionization gap therebetween,

(b) back up air gap means bridging the external surfaces of said two electrodes, said air gap means including first and second conductive element; insulating means defining an aperture therein, said insulating means being interposed between said first and second elements, whereby an air gap is formed therebetween, means

maintaining said first and second elements in electrical contact with associated electrodes of said housing; and wherein said first and said second conductive elements and said insulating means are formed as layers, a portion of said first conductive element and a portion of said



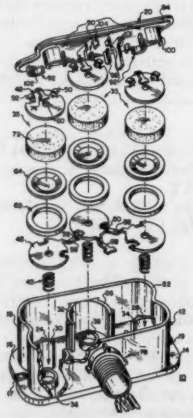
second conductive element being concentrically disposed about and closing said aperture, said air-gap means further comprising means integrally formed therewith for securing said insulating means to said conductive elements.

4,320,436

SECONDARY VALVE ARRESTER

Joseph H. Bushnell, Olean, N.Y., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Jul. 17, 1980, Ser. No. 169,909
Int. Cl.[3] H02H *1/04*
U.S. Cl. 361—128 16 Claims



1. A valve arrester, including in combination:

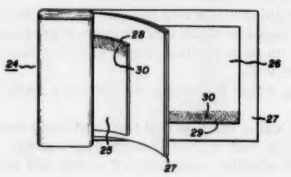
a housing comprising an open ended base portion having base wall means and upstanding side wall means extending from said base wall means, lid means for receipt on the free end of said side wall means for closing off the open end of said base portion, at least one valve block and spark gap assembly, predeterminedly shaped compartment means defined in said base portion for receiving said valve block and spark gap assembly, said valve block and spark gap assembly including first and second connecting electrodes, valve block means and spark gap means, said valve block means and spark gap means being positioned between said first and second connecting electrodes, lead means joined to said first and second connecting electrodes and extending outwardly of said housing, said lid means including first and second rib arrangements extending therefrom into said base portion, one of said first and second rib arrangements being of a greater length than the other of said first and said second rib arrangements, the first one of said rib arrangements for engaging said valve block and spark gap assembly when a valve block means of a first thickness is included in said valve block and spark gap assembly and the second of said rib arrangements for engaging said valve block and spark gap assembly when a valve block means of a second thickness is included in said valve block and spark gap assembly, said first rib arrangement being aligned with said valve block and spark gap assembly upon receipt of said lid means on said open end of said base portion in a first orientation with respect thereto and said second rib arrangement being aligned with said valve block and spark gap assembly upon receipt of said lid means on said open end of said housing in a second orientation with respect thereto.

4,320,437

CAPACITOR WITH EDGE COATED ELECTRODE

David G. Shaw, Glens Falls, and Angelo Yializis, South Glens Falls, both of N.Y., assignors to General Electric Company, Hudson Falls, N.Y.

Filed Jun. 23, 1980, Ser. No. 161,723
Int. Cl.[3] H01G *113*
U.S. Cl. 361—303 8 Claims



1. An electrical capacitor of the high voltage power factor correction type comprising in combination

(a) a casing

(b) at least one capacitor roll section in said casing

(c) said roll section comprising a pair of spaced thin aluminum electrode foil strips and an intermediate dielectric strip all wound in roll form

(d) and a dielectric liquid of a predetermined dielectric constant in said casing and impregnating said capacitor roll section.

(e) the said dielectric strip consisting solely of one or more synthetic resin strips of a dielectric constant below about 3

(f) said dielectric fluid having a dielectric constant below about 3

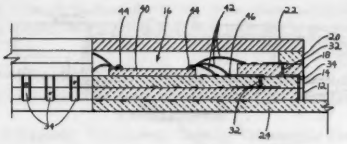
(g) at least one of said electrode foils having a narrow, thin band of a solid dielectric polymer material thereon which covers the edge on both sides thereof and being an essentially smooth unbroken and continuous layer

(h) the thickness of said polymer being in the range of 0.06 mil (1.5 u) to 0.2 mil (5 u).

4,320,438
MULTI-LAYER CERAMIC PACKAGE

Shawki Ibrahim, and James E. Elsner, both of Lafayette, Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed May 15, 1980, Ser. No. 149,968
Int. Cl.[3] H05K *1/18*
U.S. Cl. 361—401 5 Claims

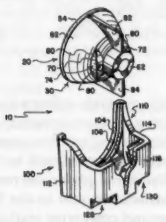


1. In a multi-layer monolithic LSI ceramic package preliminary to the placement of a cover layer and sealing of the cover layer to said ceramic package, comprising a plurality of bonded together laminas including an intermediate level lamina adapted to receive individual chips of a chip array, a plurality of chips disposed on said intermediate level lamina, conductive patterns on respective ones of said laminas with the ends of the conductive patterns spaced at least ten mil apart, the conductive pattern ends of one lamina disposed in alternating relationship relative to the ends located on an adjacent lamina, selected ones of said conductive pattern ends having wire bonds, metallized conductive means comprising metallized-filled openings forming conductive paths between conductive patterns on respective sides of selective ones of the laminas forming the ceramic package and edge-formed metallized conductive paths interconnecting conductive patterns on the multi-layer ceramic laminas, and wire connections maintaining the not less than ten mil spacing of said wire bonds respectively by extending between said chips at one end and to the selected ones of the alternating conductive pattern ends of the adjacent levels of laminas at the other end to provide electrical connections from the chips to said conductive patterns, whereby a high component density chip array may be mounted in said LSI ceramic package.

4,320,439
COMPACT LAMP UNIT AND SOCKET

Emmett H. Wiley, Chesterland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,344
Int. Cl.[3] G03B *15/02*
U.S. Cl. 362—3 48 Claims



1. A compact lamp unit especially adapted for use in a projection system such as a slide projector, microfilm viewer, and so forth, the lamp unit being characterized by a relatively small axial dimension and by a lack of pin connectors, comprising:

(a) an ellipsoidal reflector, the reflector having a concave light-reflective portion defining an optical axis, an exterior surface, and an apex at the rear of the reflector;

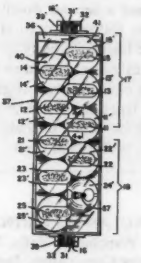
(b) an electric lamp disposed within the reflector, the electric lamp having electrical leads, the electric lamp when energized generating a beam of light projected by the reflector along the optical axis; and,

(c) electrical contacts secured to the exterior surface of the reflector, the electrical leads being connected to the contacts.

4,320,440
CONNECT SWITCH

Boyd G. Brower, and John W. Shaffer, both of Williamsport, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 19, 1979, Ser. No. 21,398
Int. Cl.[3] H05B *41/04, 43/02;* F21V *23/04;* F21K *5/02*
U.S. Cl. 362—13 9 Claims

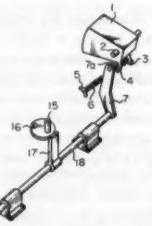


1. A radiation switch for a photoflash unit comprising an admixture of material having a dried composition by weight of 34–74% silver carbonate and/or silver oxide, 25–65% of electrically non-conductive inert particulate solids, and 0.5–5% binder, said nonconductive particulate solids including a sodium-containing material, the proportion of said sodium-containing material being not more than 10% by weight of said total dried composition.

4,320,441
RETRACTABLE HEADLIGHTS FOR RADIO-CONTROLLED TOY VEHICLES

Yukimitsu Matsushiro, Tokyo, Japan, assignor to K.K. Matsushiro, Tokyo, Japan

Filed Oct. 17, 1980, Ser. No. 197,867
Claims priority, application Japan, Oct. 19, 1979, 54-143967[U]
Int. Cl.[3] B60Q *1/06*
U.S. Cl. 362—65 6 Claims



1. A retractable headlight apparatus for a radio controlled toy vehicle, comprising a headlight body, means for supporting the headlight body so as to be movable between a raised position and a retracted position, a motor having an output shaft and having an "on" condition in which the output shaft rotates continuously in the same direction and an "off" condition in which the output shaft does not rotate, a cam member which has a endless cam track and is drivingly connected to

said output shaft to be rotated continuously in the same direction when the motor is in the "on" condition, and a cam follower which engages said cam track to be moved thereby upon rotation of the cam member and is drivingly connected to said headlight body for moving it continuously between said positions when the motor is in its "on" condition, said cam track having a first drive portion which, when engaged by the cam follower with the motor in the "on" condition, causes the headlight body to be moved towards its raised position, a first dwell portion which, when engaged by the cam follower with the motor in the "on" condition, causes the headlight body to remain in its raised position, a second drive portion which, when engaged by the cam follower with the motor in the "on" condition, causes the headlight body to be moved towards its retracted position, and a second dwell portion which, when engaged by the cam follower with the motor in the "on" condition, causes the headlight body to remain in its retracted position, the cam track being shaped so that during rotation of the cam member the cam follower engages each of the dwell portions of the cam track for a period which is substantial in relation to the period for which the cam follower engages each of the drive portions of the cam track.

4,320,442

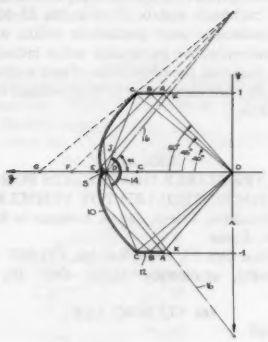
ANNULAR ILLUMINATOR

Calvin S. McCamy, Wappingers Falls, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Oct. 11, 1979, Ser. No. 83,618

Int. Cl.³ F21V *7/05, 7/08;* G02B *5/136;* G01N *21/48*

U.S. Cl. 362—301 **8 Claims**



4. A 45° annular illuminator for reflecting flux comprising:

an elliptic reflector having a surface defined by rotating a segment of an ellipse about an optic axis, said segment intersecting said optic axis, the major axis of the ellipse forming an acute angle with said optic axis;

a cylindric reflector having a surface defined by rotating a straight linear segment about said optic axis, said cylindric reflector being contiguous to said elliptic reflector and adapted both to receive flux reflected from the concave surface of said elliptic reflector and to reflect said flux to a point on said optic axis at angles of incidence of between about 40° and about 50°;

a spheric reflector spaced from said elliptic reflector and said cylindric reflector, said spheric reflector having a surface defined by rotating a segment of a circle about said optic axis, the concave surface of said spheric reflector facing the concave surface of said elliptic reflector;

a source of flux located on said optic axis intermediate said elliptic reflector and said spheric reflector; and

an object located along said optic axis and having a surface illuminated by flux reflected from said cylindric reflector.

4,320,443

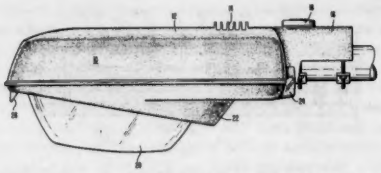
FAUNA GUARD

Alexander Zwillich, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 24, 1980, Ser. No. 143,208

Int. Cl.³ F21P *1/02*

U.S. Cl. 362—375 **8 Claims**



1. In an outdoor lighting luminaire including an elongated housing having a slip fitter means at one therof for mounting said luminaire to a luminaire support and an optical cavity at the other end thereof for confining the reflector and light source, the improvement comprising closure means releasably secured within said elongated housing intermediate said slip fitter means and said optical cavity, said closure means substantially closing off said optical cavity portion of said luminaire from access thereto by small animals.

4,320,444

CONTROL OF A HVT (HIGH VOLTAGE d-c TRANSMISSION) SHORT COUPLER

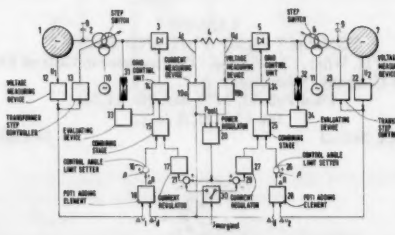
Michael Häusler, and Kadry Sadex, both of Hirschberg, Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Kafertal, Fed. Rep. of Germany

Filed Jan. 9, 1980, Ser. No. 110,694

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1979, 2901263

Int. Cl.³ H02J *3/36*

U.S. Cl. 363—35 **4 Claims**



1. Method for controlling a high-voltage d-c (HVDC) transmission installation having a short coupler, including a first rectifier converter station having current control gates, a first current converter transformer connected to the first rectifier converter station, a first three-phase current network connected to the HVDC installation and to the first current converter transformer, a second converter station having current control gates, a second current converter transformer connected to the second converter station, a second three-phase current network connected to the HVDC installation and to the second current converter transformer, two grid control units each

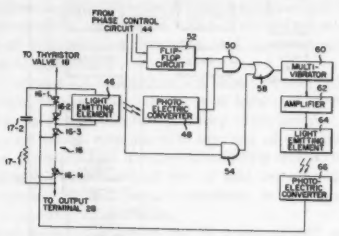
connected to one of the converter stations for controlling the current control gates thereof, two current regulators each being connected to one of the grid control units, means for supplying a current value to each current regulator, the current regulator connected to the grid control

unit of the second converter station being supplied a nominal current value which is less than the current value supplied to the current regulator connected to the grid control unit of the first converter station by a given marginal current wherein the improvement comprises providing step switches in the current converter transformers exclusively for regulating voltage fluctuations of the three-phase networks, controlling the second converter station with a constant settable control angle, and regulating voltage fluctuations of the three-phase networks lasting longer than a given duration with the step switches.

4,320,445
GATE CONTROL CIRCUIT FOR THYRISTOR CONVERTER

Sumio Kobayashi, Yokohama; Tadashi Takahashi, Kawasaki; Hidetoshi Ino, Kunitachi, and Takami Sakai, Akishima, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 5, 1980, Ser. No. 184,262
Claims priority, application Japan, Sep. 10, 1979, 54-115159
Int. Cl.³ H02H 7/125
U.S. Cl. 363—54 **6 Claims**



1. A gate control circuit for a thyristor converter which includes bridge means including arms individually constituted by respective thyristor valves each having a plurality of thyristors connected in series and phase control means for producing a signal commanding the conduction of the individual thyristor valves in the bridge means and said converter is operated in a bypass pair operation mode at the time of the start before being switched over to a deblock operation mode comprising:

detecting means connected across the anode-to-cathode path of at least one of the thyristors in one of the thyristor valves in said bridge means for producing a detection signal corresponding to the anode-to-cathode voltage across said one of the thyristors;

first means connected to said phase control means and detecting means for producing a first gate signal according to the detection signal and a first signal commanding the conduction of the thyristor valve connected to said detecting means; and

second means connected to said phase control means for producing a second gate signal according to the first gate signal and a second signal commanding the conduction of the thyristor valve to be operated for deblocking with the thyristor valve connected to said detecting means.

4,320,446
COCKCROFT-WALTON VOLTAGE MULTIPLYING CIRCUIT FOR SLIM HOLE WELL LOGGING TOOL

Obie M. Langford, and Albert P. Richter, Jr., both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 5, 1980, Ser. No. 146,738
Int. Cl.³ H02M 7/10
U.S. Cl. 363—59 **4 Claims**

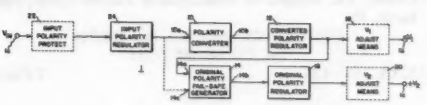
1. A Cockcroft-Walton voltage multiplying circuit adapted for use in a slim hole well logging tool comprising a plurality of capacitor means including a first capacitor means, adapted to receive an input voltage, and a last capacitor means; a plurality of high voltage rectifier means, each rectifier means, except for a last rectifier means, physically as well as electrically interconnect two capacitor means and the last rectifier means being connected to the last capacitor means so that all the capacitor means and rectifier means form an in-line rigid body, and each rectifier means includes a non-conductive plastic body having two ends, adapted to fit over ends of the capacitor

means with clearance holes for the capacitor means terminals, three channels and two threaded holes; a non-conductive plastic cap which fits between the ends of the plastic body having two counter sunk clearance holes which align with the receivers of the body, and two screws for securing the cap to the body when threaded into the threaded holes; and output means connected to the last rectifier means for providing a high voltage developed by the capacitor means and the rectifier means.

4,320,447
FAIL-SAFE AMPLIFIER POWER SUPPLY

Geoffrey H. Krauss, 16 Riviera Dr., Latham, N.Y. 12110

Filed Nov. 12, 1980, Ser. No. 205,995
Int. Cl.³ H02M 3/02
U.S. Cl. 363—63 **13 Claims**



1. A power supply, comprising:

input means for receiving a single power-supply-operating potential;

first and second output terminals;

first means coupled to said input means for providing a first D.C. potential of a predetermined magnitude and polarity to said first output terminal; and

fail-safe means for providing a second D.C. potential of predetermined magnitude and polarity to said second output terminal only if said first means is operational and said first potential is present at said first output terminal.

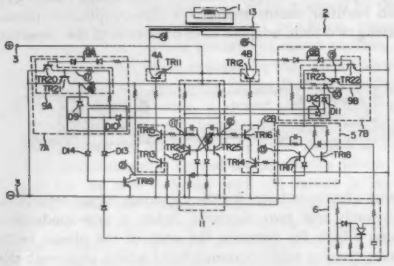
4,320,448
VIBRATING COMPRESSOR

Yukio Okuda, Fukaya; Naohiro Katayama, Tokyo, and Toslo Izumi, Ota, all of Japan, assignors to Sawafuji Electric Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1980, Ser. No. 155,888
Claims priority, application Japan, Jun. 13, 1979, 54-74184
Int. Cl.³ H02M 7/537
U.S. Cl. 363—134 **10 Claims**

1. A vibrating compressor having a drive coil which is vibrated in a magnetic field by an alternating current supplied from a power source for driving a piston wherein a d-c/a-c converter circuit comprising at least one main switching element for supplying said alternating current to said drive coil; a zero-cross delay circuit for monitoring the level of a voltage generated in said drive coil, detecting a timing at which the voltage level intersects with the zero level, and generating a signal after the lapse of a predetermined time from the time at which the voltage level intersects with the zero level; an on-

time cycle setting circuit which is triggered in accordance with the output of the zero-cross delay circuit to set the time cycle of the ON or OFF state of said main switching element; and a starting circuit for supplying starting signals to said on-time cycle setting circuit is provided, and characterized in that said on-time cycle setting circuit is constructed so as to bring said



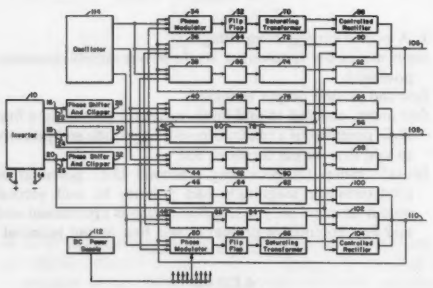
main switching element into the ON state to apply voltage to said drive coil at a timing given by the output of said zero-cross delay circuit after an alternating counter electromotive force generated in said drive coil has intersected with said zero level, and so as to bring said main switching element into the OFF state at a timing before said alternating counter electromotive force subsequently intersects with said zero level.

4,320,449

CONTROL CIRCUIT

James C. Carroll, North Huntingdon Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 22, 1962, Ser. No. 182,716
Int. Cl.[3] H02M *7/515*
U.S. Cl. 363—135 **7 Claims**



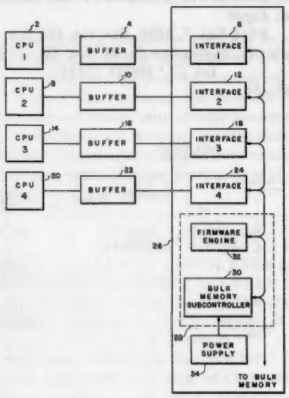
1. A direct current to alternating current conversion apparatus comprising, a plurality of controlled rectifiers each having a conducting and a non-conducting state, each of said controlled rectifiers having an anode-cathode circuit and a triggering electrode, first means for changing a direct current to a first frequency alternating current, said state of conduction of each of said plurality of controlled rectifiers being determined by a control circuit comprising a phase shifting network connected with and responsive to said first frequency alternating current from said first means, said first frequency alternating current connected with said anode-cathode circuits of said plurality of controlled rectifiers, second means connected to said phase shifting circuit modulating said phase shifted first frequency alternating current at a second frequency alternating current, said modulated first frequency alternating current connected to said plurality of controlled rectifier trigger electrodes so that said controlled rectifiers are rendered conductive in a predetermined sequence to provide an output voltage at said second frequency alternating current.

4,320,450

PROTECTION APPARATUS FOR MULTIPLE PROCESSOR SYSTEMS

Steven A. Rose, Glendale, and Edward H. Forrester, Phoenix, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 30, 1979, Ser. No. 89,493
Int. Cl.[3] G06F *15/16, 11/30*
U.S. Cl. 364—200 **9 Claims**



5. In a multiple processor system wherein a plurality of processor units are operatively associated with a common bulk memory unit and having a multiported memory control unit for controlling the transactions between said bulk memory unit and said processor units, protecting means for protecting data against loss in the event of the occurrence of a predetermined condition at one or more of said processor units, said protecting means including;

a plurality of port interface units, each operatively connected between said multiported memory control and one of said processor units, respectively;

said processor units being operative to produce output signals indicative of predetermined conditions thereat;

said port interface units including means responsive to said output signals from the associated one of said processor units to provide a first signal indicative of the presence of a said predetermined condition and a second signal indicative of the identity of the predetermined condition;

said first signal from all of said port interface units being connected to a common input to said multiported memory control unit; said multiported memory control unit being programmed to interrogate said common input on a high frequency repetitive basis to detect the presence of a first signal thereat;

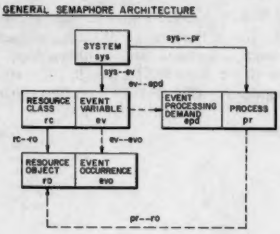
said memory control unit being further programmed responsive to the presence of a first signal to interrogate said second signals to identify the predetermined condition; and

said memory control unit including means responsive to said second signal to control the operation of the affected one of said processor units relative to said bulk memory unit to protect the data relating to said affected processor unit.

4,320,451
EXTENDED SEMAPHORE ARCHITECTURE

Charles W. Bachman, Lexington, and Jacques Bouvard, Wellesley, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 19, 1974, Ser. No. 462,551
Int. Cl.³ G06F *9/00*
U.S. Cl. 364—200 **57 Claims**



1. An extended semaphore mechanism associated with an event whose occurrence is the detection in any of a first plurality of processes of a condition which is significant to any of a second of a plurality of processes, said extended semaphore mechanism comprising:

a. first means for establishing on behalf of said any of said second processes an interest in at least one event occurrence in any of said first plurality of processes;

b. second means, responsive to said any of said plurality of first processes and coupled to said first means, for monitoring on behalf of said any of said second plurality of processes for said event occurrence, in said any of said first plurality of processes;

c. third means coupled to said first and second means for notifying said any of said second plurality of processes of said event occurrence in said any of said first plurality of processes; and,

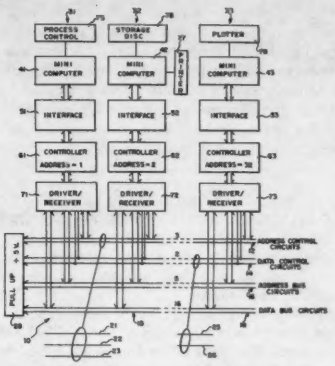
d. fourth means responsive to said third means for trapping said any of said plurality of second processes upon the notification of the detection of said event occurrence in said any of said first plurality of processes.

4,320,452
DIGITAL BUS AND CONTROL CIRCUITRY FOR DATA ROUTING AND TRANSMISSION

Mark F. Kempf, Glen Ellyn; D'Arcy C. Randall, Winfield, and Timothy R. Walworth, Naperville, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 29, 1978, Ser. No. 920,409
Int. Cl.³ G06F *15/16*
U.S. Cl. 364—200 **8 Claims**

1. An asynchronous, linear, open ended digital bus for use with and adapted to be coupled to, two or more computer/-controllers, said bus including address control circuit lines comprising a bus busy line used by a controller to assert a bus busy signal thereon to gain control of the bus and to determine if another computer/controller is using the bus, a receiver computer/controller request line used by a controller for requesting permission to send data to another controller, and a receiver computer/controller ready line used by a controller for indicating that the controller is ready to receive data, data control circuit lines comprising a data ready line used by a controller for placing a ready-to-send-data signal thereon and a data accept line used by a controller for placing a ready-to-accept-data signal thereon, address bus circuit lines comprising five binary address lines used by a controller for placing an address thereon, which address can have up to five bits, a plurality of data bus circuit lines coupled to the two or more controllers and adapted to receive data to be transferred thereon from a controller, and a voltage source coupled to the digital bus lines for pulling up the voltage on all the digital bus lines to the voltage level of the voltage source to make certain

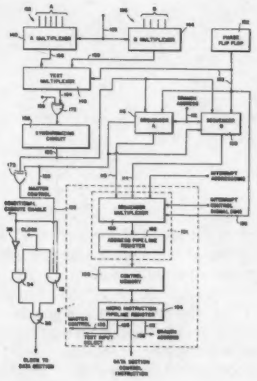


that clear signals are provided on the bus and noise problems are avoided.

4,320,453
DUAL SEQUENCER MICROPROCESSOR

William H. Roberts, Corona Del Mar, and Paul A. Rutkowski, Mission Viego, both of Calif., assignors to Digital House, Ltd., Santa Ana, Calif.

Filed Nov. 2, 1978, Ser. No. 957,146
Int. Cl.³ G06F *9/22, 9/38*
U.S. Cl. 364—200 **26 Claims**



1. A control section for use in a microprocessor having a control section containing microinstructions for two independent microprograms and a data section, comprising:

(i) first and second sequencer means, each having an output bus and at least one input bus, each said sequencer means for generating for a corresponding microprogram an address signal in response to external data received on said at least one input bus and for providing said address signal on said output bus, wherein said first and second sequencer means generate address signals during alternating time periods; and

(ii) address processing means, having a first input bus coupled to the output bus of said first sequencer means, a second input bus coupled to the output bus of said second sequencer means, and an instruction output bus coupled to said data section, said address processing means for subsequently converting each previously generated address

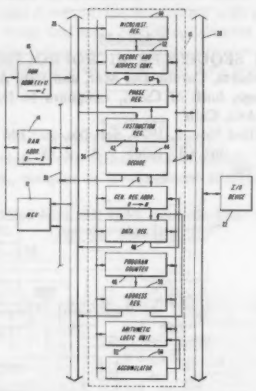
signal into a microinstruction for the corresponding microprogram, and for making each said microinstruction available on said instruction output bus subsequent to said conversion, for execution by said data section,

wherein each of the sequencer means generates a new address signal for the corresponding microprogram during the time period in which the microinstruction corresponding to the previous address signal generated by that sequencer means is made available for execution, thereby resulting in the most efficient use of said address processing means and said data section.

4,320,454
APPARATUS AND METHOD FOR OPERAND FETCH CONTROL

Seigo Suzuki, Yokohama; Seiji Eguchi, Kawasaki, and Yoshiaki Moriya, Inagi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 878,084, Feb. 15, 1978, abandoned, which is a continuation of Ser. No. 747,348, Dec. 3, 1976, abandoned. This application Jun. 4, 1979, Ser. No. 45,258
Claims priority, application Japan, Dec. 4, 1975, 50-144627
Int. Cl.³ G06F *9/34*
U.S. Cl. 364—200 **19 Claims**



1. A method for fetching an operand in a data processing apparatus having a central processing unit including an instruction register and a plurality of general registers, said apparatus further including a main memory unit coupled for communication with said central processing unit and means for addressing said general registers and said main memory unit to access said registers and selected storage locations in said memory to fetch data therefrom, the addresses used to designate said registers being identical to the addresses used to designate a portion of said accessible memory storage locations, said method comprising the steps of:

entering an instruction word into said instruction register, said word including an operand address code and an address modification mode code, the latter specifying by selected bit combinations the general storage location of an operand and the mode of addressing required to fetch it;

determining from the bit contents of said address modification mode code whether an operand is stored in said general registers or in said main memory;

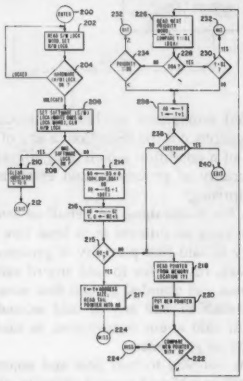
deriving the address of said operand from said operand address code in accordance with the mode of addressing specified by said mode code, said operand address code including either the complete address in said general registers of said operand or the complete address in said general registers of a main memory address code applicable for deriving the address of said operand from data located within said main memory unit; and

executing an operand fetch in either said general registers or said main memory, depending on the results of said step of determining, at the address derived in said deriving step.

4,320,455
QUEUE STRUCTURE FOR A DATA PROCESSING SYSTEM

William E. Woods, Natick; Philip E. Stanley, Westboro, and Thomas S. Hirsch, Bedford, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 868,146, Jan. 9, 1978, abandoned. This application Dec. 3, 1979, Ser. No. 100,028
Int. Cl.³ G06F *9/36*
U.S. Cl. 364—200 **10 Claims**



1. In a data processing system including a processor for executing microinstructions to perform selected operations on data, a queuing system for the data and operations comprising:

data storage means coupled to said processor and including a list of data storage frames for temporarily storing queuing information describing the location and priority of data received by said data processor, said queuing information being stored in said data storage means in said list of data storage frames, the first frame in said list being a lock frame for controlling access to said list when another operation is being performed on said list, and the remaining frames in said list being priority frames associated with said lock frame, each of said priority frames corresponding to an element of data to be operated upon by said processor, each of said priority frames including:

an addressable data storage location for storing a priority number assigned by said processor for indicating the relative priority of said priority frame;

an addressable data storage location for storing a pointer including address information for locating another of said priority frames; and

an addressable data storage location for storing information corresponding to said priority frame; said lock frame including:

an addressable data storage location for storing a control word associated with said list for indicating whether said associated list can be accessed by said processor:

an addressable data storage location for storing a first frame pointer including address information for locating the first of said priority frames in said associated list; and

an addressable data storage location for storing a last frame pointer including address information for locating the last of said priority frames in said associated list;

said queuing system further comprising:

control store means coupled to said processor for storing

said microinstructions and for selectively supplying said stored microinstructions to said processor, said control store including:

first means for controlling said processor to selectively access the contents of said lock frame;

second means for controlling said processor responsive to the contents of said accessed lock frame to enable access by said processor to said list of priority frames associated with said accessed lock frame;

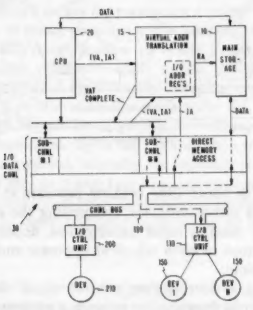
third means for controlling said processor responsive to the receipt of additional data and to said priority numbers included in said accessed priority frames for inserting additional priority frames corresponding to said additional data into said list in a relative position determined by the priority of said received data; and

fourth means for controlling said processor to retrieve selectively any one of said priority frames from said list on the basis of either the priority number of said frame to be retrieved or to the address of said frame to be retrieved.

4,320,456
CONTROL APPARATUS FOR VIRTUAL ADDRESS TRANSLATION UNIT

Nyles N. Heise, Rochester; Roy L. Hoffman, Pine Island; Istvan S. Kiss, Rochester; David O. Lewis, Rochester; James J. Pertzborn, Rochester, and Thomas S. Robinson, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 18, 1980, Ser. No. 113,863
Int. Cl.³ G06F *3/00, 9/36*
U.S. Cl. 364—200 **6 Claims**



3. Control apparatus for controlling virtual storage address translation means in a computer system having a main storage, a central processing unit (CPU), a channel, a shared control unit and a plurality of I/O devices where the virtual address translation means translates virtual storage addresses to real storage address for addressing main storage and where said channel is connected to said CPU to receive input/output (I/O) commands therefrom, connected to said virtual address translation means, connected to said main storage and connected to said shared control unit, said shared control unit being connected to control said plurality of I/O devices, said I/O commands being issued by said CPU in one sequence and said plurality of I/O devices performing said I/O commands in a sequence dependent upon the order in which said commanded I/O devices become ready to perform said I/O commands, each of said plurality of I/O devices having a variable period of time from the time of being commanded to the time of being ready to perform the command, comprising:

interrupt request synchronizing means connected to receive an I/O command from said CPU and an I/O device command from said shared control unit, said I/O device command being generated by said shared control unit in response to the first one of said commanded I/O devices being ready to perform the command and operable to generate a CPU request signal in response to an I/O command from said CPU in the absence of a pending I/O device command and operable to generate a device request signal in response to an I/O device command from said shared control unit in the absence of a simultaneous I/O command from said CPU,

a dedicated addressable I/O device resolved address register for each I/O device connected to said shared control unit,

a first source of virtual addresses, one for each I/O device connected to said shared control unit,

a first source of addresses for addressing said dedicated I/O device resolved address registers,

a pool of addressable I/O resolved address registers for shared use by said plurality of I/O devices,

a second source of virtual addresses,

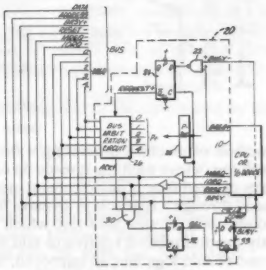
a second source of addresses for addressing said pool of I/O resolved address registers,

control means connected to receive said CPU request signal and said device request signal from said interrupt request synchronizing means and connected to said first and second sources of virtual addresses and responsive to said CPU request signal for providing said virtual address translation means with one of said virtual addresses from said first source of virtual addresses for translation to a real storage address and with an address from said first source of addresses for addressing one of said dedicated I/O resolved address registers for one of said I/O devices connected to said shared control unit into which the translated real storage address is to be loaded and responsive to said device request signal for providing said virtual address translation means with a plurality of virtual storage addresses from said second source of virtual addresses for translation to a plurality of real storage addresses and with a plurality of addresses from said second source of addresses for addressing said pool of I/O resolved address registers into which the plurality of real storage addresses are to be loaded.

4,320,457
COMMUNICATION BUS ACQUISITION CIRCUIT

Roy K. Tanikawa, Irvine, Calif., assignor to General Automation, Inc., Anaheim, Calif.

Filed Feb. 4, 1980, Ser. No. 118,546
Int. Cl.³ G06F *9/46*
U.S. Cl. 364—200 **7 Claims**



1. Apparatus for resolving priority between a group of devices contending for use of a common multi-conductor communication bus, comprising:

means at each device generating a binary coded multi-bit priority number, a group of conductors in the bus connected to each of the devices, there being one conductor for each bit of the priority numbers, means at each device connected to the group of conductors and the associated means generating a priority number for forcing the conductor associated with each bit of the priority number to

the value of the associated bit when the bit is at a first predetermined one of its binary values, means at each device connected to the conductors and to said means generating a priority number for comparing each order of bit in the priority number with the binary value of the associated conductor, means in each device inhibiting the comparing means of the lower order bits when a higher order bit comparison is not equal, means at each device responsive to the comparing means when all the priority number bits are equal to the bit value on the associated conductors for generating a signal indicating that the associated device has priority, means at each device connected to the bus for generating a signal on the bus indicating when the bus is available for use by any of the rival devices, and means at each device connected to said means responsive to the comparing means and connected to the bus, said last-named means being responsive to said signal indicating the device has priority and said signal indicating the bus is available for providing access to the bus by the associated device whenever said signal on the bus indicates the bus is available.

4,320,458

WELL LOG PROCESSING TECHNIQUE

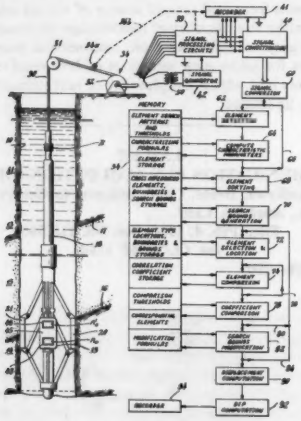
Philippe Vincent, Chilly Mazarin, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 362,160, May 21, 1973, abandoned. This application Nov. 15, 1979, Ser. No. 94,597

Claims priority, application France, May 19, 1972, 72.17978

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—422 **31 Claims**



1. A method of machine processing a first well log and a second well log, where each log is made up of a multiplicity of log samples derived from a device taking measurements while being passed through a borehole in an earth formation, so as to locate components of said first log which are likely to be incorrectly depth displaced relative to said second log and to convert one of said logs into an improved, depth-shifted log, comprising the following steps each of which is machine implemented:

(a) filtering the logs to locate within each log a plurality of log elements which correspond to respective element types of a collection of different preselected element types, where each preselected element type corresponds to a significant well log feature and may thus correspond to a significant earth formation feature;

(b) finding, according to the type of element, a number of representative characteristic parameters of each of the log elements located in the preceding step;

(c) matching the characteristic parameters found in the preceding step for a log element with the corresponding parameters found in the preceding step for log elements of the other log to find which log elements correspond to each other; and

(d) depth-shifting one of said logs based on log element correspondence found in the preceding step and producing a tangible representation of the resulting depth-shifted log.

4,320,459

PROCESS AND APPARATUS FOR CONTROLLING THE BRAKING PRESSURE IN ANTI-SKID MOTOR VEHICLE BRAKE SYSTEMS

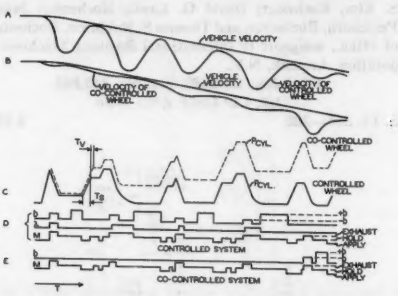
Klaus Lindemann, Hanover; Konrad Rode, Seelze, and Erwin Petersen, Wunstorf, all of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Jul. 11, 1979, Ser. No. 56,680

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1978, 2830580

Int. Cl.³ B60T *8/02*

U.S. Cl. 364—426 **4 Claims**



1. A method of controlling braking pressure in an anti-skid brake system for motor vehicles, comprising the steps of,

(a) separately sensing rapid deceleration, acceleration, and skid conditions of each wheel at opposite ends of an axle of said vehicle,

(b) producing a deceleration control signal for a braked wheel when its deceleration exceeds a predetermined rate,

(c) producing a skid control signal for a braked wheel when a skid condition of that wheel is detected,

(d) reducing the braking pressure applied to both wheels on said axle when a deceleration control signal or a skid control signal is produced for either wheel during an initial brake application,

(e) producing an acceleration control signal for a wheel when its acceleration exceeds a predetermined rate,

(f) periodically reapplying braking pressure to wheels at both ends of said axle under fast application conditions for a predetermined time period established when a deceleration control is previously produced,

(g) halting further increase of braking pressure on the rapidly decelerating wheel corresponding to the produced deceleration control signal and holding existing braking pressure,

(h) continuing to increase the braking pressure on the other wheel of said axle at said first application rate for a second predetermined time period,

(i) applying a second pulse of increasing braking pressure to each wheel subsequent to said second time period,

(j) exhausting the braking pressure on both wheels following said second pulse when another deceleration control signal is produced,

(k) continuing to exhaust the braking pressure on the con-

trolled wheel until the production of a slip control signal ceases, and

(l) repeating the timed application and release cycles of the braking pressure until desired vehicle velocity is obtained.

4,320,460
ANTI-SKID BRAKE CONTROL SYSTEM

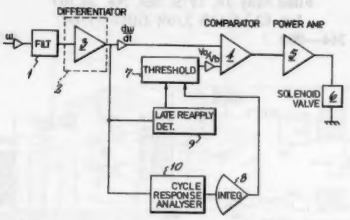
Malcolm Brearley, and John Adamson, both of West Midlands, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Sep. 17, 1979, Ser. No. 76,492

Claims priority, application United Kingdom, Sep. 15, 1978, 37046/78

Int. Cl.³ B60T *8/02*

U.S. Cl. 364—426 **11 Claims**



1. A vehicle anti-skid brake control system comprising brake pressure control means for producing a release signal to trigger the release of brake pressure and a subsequent re-apply signal to trigger the re-application of brake pressure in successive brake pressure release/re-apply cycles, means for measuring the duration of each synchronous running period during which the wheel is decelerating at substantially the same rate as the vehicle, and means for adjusting the timing of the re-apply signal in dependance upon the duration of a previous synchronous running period whereby an increase or decrease in the duration of said previous synchronous running period relative to an optimum duration of synchronous running period causes said re-apply signal to occur at an earlier or later time respectively.

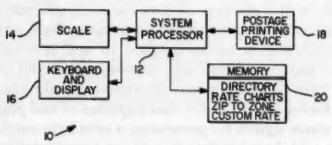
4,320,461
POSTAGE VALUE CALCULATOR WITH EXPANDED MEMORY VERSATILITY

Daniel F. Dlugos, Huntington, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 13, 1980, Ser. No. 159,029

Int. Cl.³ G06F *15/40;* **G01G** *19/413*

U.S. Cl. 364—466 **10 Claims**



1. A postage value calculator comprising

means for introducing postal information,

memory means for storing postage data at a plurality of storage locations,

accessing means for retrieving the postage data from the memory means in accordance with the introduced postal information, the accessing means including an address counter for generating an address of a memory storage location, and

means for generating a postage value in accordance with the retrieved postage data,

the calculator further including

addressing data,

selected storage locations of the memory means storing the addressing data, the selected storage locations being equidistantly spaced from one another by a predetermined number of consecutively positioned memory storage locations, the addressing data stored at the equidistantly spaced selected storage location comprising data for determining the memory location of the next sequential segment of postage data requisite for generation of a postage value, and

means for determining when an accessed memory address is a selected storage location address, the determining means including means for examining the storage location address generated by the address counter.

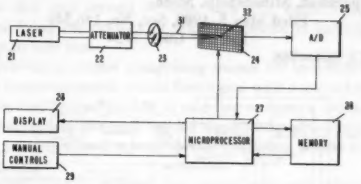
4,320,462
HIGH SPEED LASER PULSE ANALYZER

Roger E. Lund, and Michael P. Wirick, both of Los Angeles, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 31, 1980, Ser. No. 135,408

Int. Cl.³ G01N *21/00*

U.S. Cl. 364—525 **2 Claims**



1. A laser system analyzer for determining from a single laser pulse, the total energy, relative position and divergence of a laser beam made incident thereupon, said apparatus comprising:

a two-dimensional array of detector elements for detecting laser energy received by respective detector elements from a single laser pulse and providing signals indicative of said laser energy;

first means coupled to said detector array for digitizing the signals provided thereby;

microprocessor means, including a digital memory, for scanning said detector array in a predetermined manner and storing digitized signals received thereby, and for processing said digitized signals so as to provide values of the total energy, relative position and divergence of said laser pulse; and

means for displaying the values determined by said microprocessor means.

4,320,463
PRODUCTION CONTROL SYSTEM

Sydney Himmelstein, Lake Bluff, Ill., assignor to S. Himmelstein and Company, Hoffman Estates, Ill.

Filed Feb. 25, 1980, Ser. No. 123,932

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—552 **3 Claims**

1. A method of controlling a continuous product manufacturing process comprising the steps of:

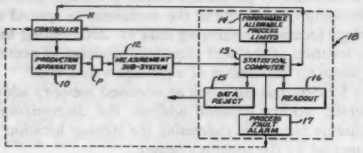
preselecting permissible limits of variations in a parameter of the product being manufactured;

sequentially determining the value of the parameter as the product is manufactured;

determining the mean ± 3 standard deviations of a first preselected group of the sequentially determined values;

determining the mean ± 3 standard deviations of a different preselected group of the sequentially determined values, said different group including the next value determined

subsequent to those of the previous group and all but the first determined value of the previous group;
repeating the last named step throughout the process;
providing a signal as an incident of the determined permissible limits; and



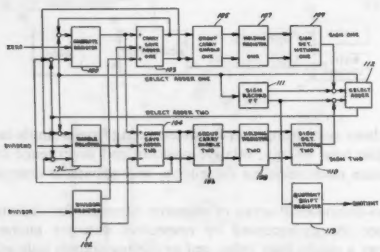
identifying products for which said determination randomly falls outside said permissible limits, the determination of the mean ±3 standard deviations being made with less than full batch weighting.

4,320,464

BINARY DIVIDER WITH CARRY-SAVE ADDERS

Daniel J. Desmonds, Roseville, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed May 5, 1980, Ser. No. 146,549
Int. Cl.³ G06F 7/54
U.S. Cl. 364—766 **8 Claims**



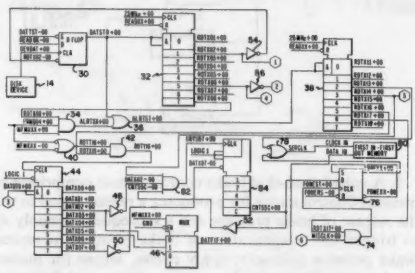
1. A binary divider comprising:
an enable register means for receiving a dividend,
a register means for receiving a divisor,
a generate register means,
first and second carry-save adders, the first adder connected to receive inputs from said enable register, register means for receiving a divisor and generate register and the second adder connected to receive inputs from said enable register, the complement of the contents of said register means for receiving a divisor, and generate register, said first and second carry-save adders producing first and second possible partial remainders at each cycle of the division process,
first and second means for determining the sign of the first and second possible partial remainders connected to said first and second adders, respectively,
sign record flip-flop means for storing the sign of the partial remainder selected on the next preceding cycle of the division process,
adder select gate means for gating the outputs of one of said adders to said enable register and to said generate register for a further cycle of the division process, said adder select gate means being connected with said sign record flip-flop means to provide the sign of the selected partial remainder at each cycle of the division process and to receive the stored sign of the preceding partial remainder and to receive an output from said first and second means for determining the sign of the possible partial remainder at each cycle of the division process to use in determining which of said adder outputs is to be gated, and
a quotient shift register means connected to an output of said sign record flip-flop means for storing quotient bits as they are developed.

4,320,465

DIGITAL FREQUENCY MODULATION AND MODIFIED FREQUENCY MODULATION READ RECOVERY WITH DATA SEPARATION

Donald J. Rathbun, Andover, and David B. O'Keefe, Westford, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 14, 1979, Ser. No. 38,767
Int. Cl.³ G11B 5/09; G06F 13/04
U.S. Cl. 364—900 **6 Claims**



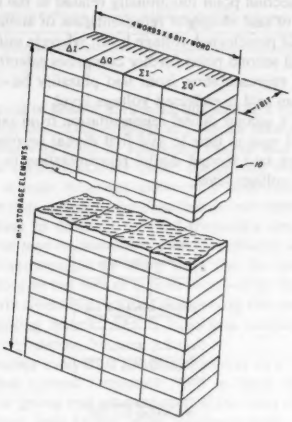
1. A data recovery system for converting an information stream of clock signals and data signals received from a device in a plurality of modes into decoded data signals representative of a plurality of synchronization bytes and a plurality of address mark bytes to synchronize said information stream received from said device, and a plurality of data field bytes comprising:
interval timing means for receiving said information stream and including first shifting means for generating a plurality of shift timing signals and counting means responsive to said plurality of shift timing signals for generating interval timing signals indicative of the time between successive information signals of said information stream at a predetermined logic level;
read only memory means coupled to said interval timing means and responsive to said plurality of shift timing signals and said interval timing signals for generating a sequence of a plurality of data status signals indicative of said decoded data signals and a missing clock signal; and
data interpretation means coupled to said interval timing means and to said read only memory means and including zero byte counting means responsive to said plurality of shift timing signals and to said sequence of said plurality of data status signals for generating a zero byte output signal when said decoded data signals are representative of one of said plurality of synchronization bytes,
and further including data field recognition means responsive to said zero byte output signal, said plurality of shift signals and said sequence of said plurality of data status signals including said missing clock signal for generating a serial clock signal indicative of said information stream including a predetermined number of synchronization bytes, and address mark bytes and that the following bytes of said information stream are representative of said plurality of data field bytes.

4,320,466

ADDRESS SEQUENCE MECHANISM FOR REORDERING DATA CONTINUOUSLY OVER SOME INTERVAL USING A SINGLE MEMORY STRUCTURE

Dewey R. Myers, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 26, 1979, Ser. No. 88,742
Int. Cl.[3] G06F 9/32
U.S. Cl. 364—900 8 Claims



1. A signal processor comprising:

(a) a memory having a capacity for storing data for a preselected processing interval (PI);

(b) an address sequencing mechanism connected to the memory, said address sequencing mechanism producing addresses in accordance with the following address equation:

$ADD_{K+1}+ADD_K+AI_J$

but if $ADD_K+AI_J>SA+m\cdot n-1$;

then $ADD_{K+1}=ADD_K+AI-(m\cdot n-1)$

where: ADD_K=present address, ADD_K+1=calculated next address, SA=memory start address, m=number of columns, n=number of rows, AI_J=address increment for the present PI and AI_{J+1}=addressing increment for the next PI; said addresses for continuously reading out of the memory the data for the preceding interval in a data out order while continuously overwriting data, in a data in order, for the next processing interval into the memory locations from which the data was read out, each of said addresses for the first processing interval incremented by one and thereafter each address for each subsequent processing interval incremented in accordance with the formula:

$$AI=PAI\cdot m(\text{integer of } PAI\cdot m/m\cdot n-1)-(m\cdot n-1)$$

where: AI is the address increment for each address of the next processing interval, PAI is the address increment of the present processing interval, and m and n are, respectively, the preselected number of columns and rows in the data format for the memory; and

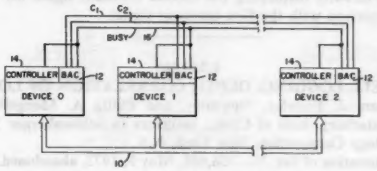
(c) a controller operatively connected to the address sequencing mechanism and memory for providing selected control signals thereto.

4,320,467

METHOD AND APPARATUS OF BUS ARBITRATION USING COMPARISON OF COMPOSITE SIGNALS WITH DEVICE SIGNALS TO DETERMINE DEVICE PRIORITY

Jeremy M. Glass, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 25, 1980, Ser. No. 124,191
Int. Cl.[3] G06F 9/46; H04Q 3/00
U.S. Cl. 364—900 14 Claims



1. A bus arbitration circuit of a first device connected to a common bus with a second device, said circuit determining the priority of said first device relative to said second device for gaining access to said bus, said circuit comprising:

means for providing a first signal to a line interconnecting said first and second devices, said first signal uniquely identifying the priority of said first device in gaining access to said bus;

said providing means comprising means for synchronizing the commencement of said first signal with a second signal from said second device to said line to form a composite signal on said line, said second signal uniquely identifying the priority of said second device in gaining access to said bus; and

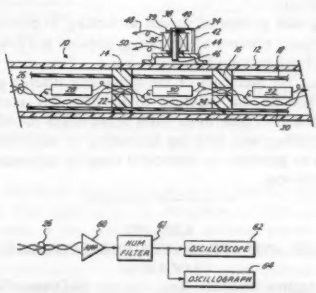
means responsive to said first signal and said composite signal for determining the priority of said first device relative to said second device for gaining access to said bus.

4,320,468

METHOD FOR TESTING A SEISMIC MARINE CABLE

Edwin A. Montross, Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Filed Oct. 17, 1980, Ser. No. 198,079
Int. Cl.[3] H04R 29/00
U.S. Cl. 367—13 5 Claims



1. A method for in-situ testing the relative transient responses of individual hydrophones selected from a plurality of hydrophones mounted within a seismic streamer cable that consists of at least a sealed outer jacket containing a lightweight fluid and a plurality of electrical conductors for interconnecting the hydrophones into groups and for transmitting output signals from said groups, comprising the steps of:

(a) introducing a low-lever reproducible pressure pulse in

the fluid in the immediate vicinity of a first selected hydrophone to generate a first transient signal;
(b) directly displaying said first transient signal;
(c) measuring the polarity, amplitude and period of the displayed first transient signal;
(d) introducing a substantially idential low-level pressure pulse in the fluid in the immediate vicinity of a second selected hydrophone to generate a second transient signal; and
(e) directly displaying the second transient signal for comparison with the first transient signal.

4,320,469

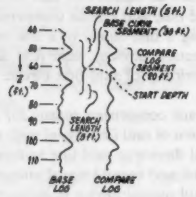
WELL LOGGING: DEPTH CORRELATION OF LOGS

William J. Frawley, Newtown, and Philip A. Mongelluzzo, Waterbury, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 358,685, May 9, 1973, abandoned. This application Sep. 28, 1979, Ser. No. 80,790

Int. Cl.³ G01V *1/40, 1/36*

U.S. Cl. 367—33 **15 Claims**



1. A machine-implemented method of modifying a depth-varying first log of a borehole in an earth formation to generate an improved version thereof comprising the steps of:
matching portions of said first log with portions of a second log at various depths therealong to generate a plurality of signals indicative of the degree of correspondence therebetween;
filtering said signals according to predetermined criteria to remove unsuitable signals or portions thereof from further consideration;
grouping the remaining filtered signals into groups of signals, each group comprising members which are depth-wise adjacent neighbors of at least one other member of the group;
filtering said groups of signals according to predetermined criteria to remove unsuitable groups or portions thereof from further consideration;
matching the members of the remaining filtered groups of signals with one another to identify any recognizable trends and to determine valid depth-shifts therefrom; and
depth-shifting said first log according to said valid depth-shifts to generate an improved tangible representation of the first log.

4,320,470

METHOD AND APPARATUS FOR ACOUSTIC WELL LOGGING

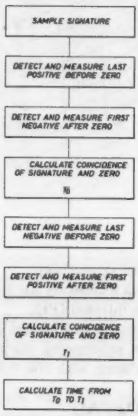
Jorg A. Angehrn, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 949,592, Oct. 10, 1978. This application Apr. 13, 1979, Ser. No. 30,049

Int. Cl.³ G01V *1/40*

U.S. Cl. 367—34 **1 Claim**

1. A method of determining the travel time of acoustic energy in subsurface earth materials traversed by a borehole, comprising:
generating acoustic energy at a location within said borehole,
detecting acoustic energy at a preselected distance from said location of acoustic energy generation,
producing an electrical representation of the detected acoustic energy, relative to a preselected voltage level,
transmitting said electrical representation to a surface location,
deriving from said electrical representation a plurality of digital representation correlative to said detected acoustic energy, at preselected discrete time sampling intervals,
determining from said digital representation a first point functionally related to said generating of acoustic energy and a second point functionally related to the first coincidence of said electrical representation of acoustic energy and said preselected voltage level, wherein said determining said second point further comprises selecting the first digital representation from said plurality having a value less than said preselected voltage level,
selecting a second digital representation from said plurality derived next in time to said first digital representation,
comparing said second digital representation to said preselected voltage level,

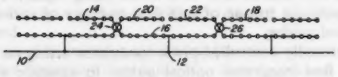

SAMPLE SIGNATURE
DETECT AND MEASURE LAST POSITIVE BEFORE ZERO
DETECT AND MEASURE FIRST NEGATIVE AFTER ZERO
CALCULATE COINCIDENCE OF SIGNATURE AND ZERO
T0
DETECT AND MEASURE LAST NEGATIVE BEFORE ZERO
DETECT AND MEASURE FIRST POSITIVE AFTER ZERO
CALCULATE COINCIDENCE OF SIGNATURE AND ZERO
T1
CALCULATE TIME FROM T0 TO T1

repeating the above steps wherein said second digital representation becomes said first digital representation until said second digital representation, when compared to said preselected voltage level, has a value larger than said preselected voltage level, and
storing said second digital representation,
deriving an indication of the velocity of said acoustic energy over said preselected distance of said earth materials relative to the portion of said digital representation between said first and second points,
generating a synchronization pulse as a function of the time of said generation of acoustic energy,
generating from said pulse a constant negative slope waveform a predetermined time after said pulse generation having an initial value greater than said preselected voltage level and a final value less than said preselected voltage level prior to said coincidence,
selecting the first digital representation from said representation having a value greater than said preselected voltage level,
selecting a second digital representation from said representation generated next in time to said first representation,
comparing said first and second digital representations.

4,320,471
SEISMIC SURVEYING METHOD

Eike Rietsch, Houston, Tex., assignor to Deutsche Texaco Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 16, 1978, Ser. No. 952,018
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1977, 2748707
Int. Cl.³ G01V *1/20*
U.S. Cl. 367—49 **6 Claims**



1. A method of seismic surveying employing a vibrator type seismic signal source controllable to generate seismic signals in selected, relatively narrow, frequency ranges, and employing at least one seismic receiver group comprising a plurality of individual seismic receivers electrically interconnected and arranged so that different combinations of individual receivers corresponding to different selected frequency ranges of said signal source may be activated to receive seismic signals, said electrical interconnections being such that an output signal corresponding to the sum of signals received by the activated individual receivers is produced comprising the steps of:

(a) generating seismic signals from said source in a first, relatively narrow frequency band;

(b) activating individual seismic receivers as a function of said first narrow frequency band to form an activated receiver group and selected so that the ratio of the lower frequency limit to the upper frequency limit of said first frequency band is smaller than the ratio of the maximum velocity of surface noise waves to the apparent velocity of reflected seismic waves from an investigation depth of interest, and generating a first narrow band seismogram in response to said first narrow band signal generation, whereby the surface wave noise signals are within the cut off region of said activated receiver group;

(c) generating seismic signals from said source in a second, relatively narrow frequency band;

(d) activating individual seismic receivers as a function of said second narrow frequency band to form an activated receiver group and selected so that the ratio of the lower frequency limit to the upper frequency limit of said second frequency band is smaller than the ratio of the maximum velocity of surface noise waves to the apparent velocity of reflected seismic waves from an investigation depth of interest, and generating a second narrow band seismogram in response to said second narrow band signal generation, whereby the surface wave noise signals are within the cut off region of said activated receiver group;

(e) correlating said first and second seismogram with said first and second generated signals to form first and second correlated seismograms; and

(f) summing said first and second correlated seismograms to produce a single, wide band seismogram.

4,320,472
DIGITAL GEOPHONE SYSTEM

J. Robert Fort, Pasadena, Calif., assignor to United Geophysical Corporation, Pasadena, Calif.

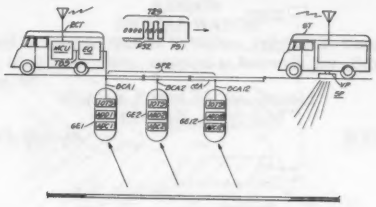
Continuation-in-part of Ser. No. 521,158, Nov. 5, 1974, abandoned. This application Nov. 14, 1977, Ser. No. 851,290
Int. Cl.³ G01V *1/22*
U.S. Cl. 367—79 **19 Claims**

19. In a method of seismic prospecting wherein seismic waves that are received at each of a plurality of seismic wave receiving stations are converted into corresponding electrical signals representing a characteristic of the received waves and the electrical signals are transferred to a recording station, the steps of:

(1) converting received seismic waves into digital electrical seismic signals at the respective geophone stations;

(2) generating address signals in digital form at the respective geophone stations, each address signal uniquely identifying a different geophone station,

(3) intermittently generating at said recording station address signals of a plurality of such geophone stations successively whereby such geophone stations are correctly addressed one at a time, and



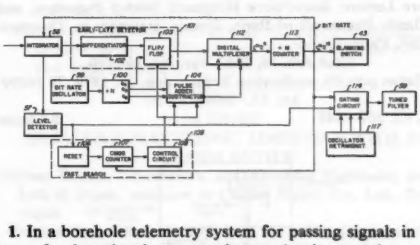
(4) transmitting a binary digital electrical signal representing the address of each geophone station from the geophone at that station to said recording station concurrently with said transmission of a digital electrical seismic signal from said geophone station to said recording station,

whereby digital electrical seismic signals are transmitted to said recording station from one geophone station at a time.

4,320,473
BOREHOLE ACOUSTIC TELEMETRY CLOCK SYNCHRONIZATION SYSTEM

Miles A. Smither, and Octavio A. Vela, both of Houston, Tex., assignors to Sperry Sun, Inc., Sugar Land, Tex.

Filed Aug. 10, 1979, Ser. No. 65,474
Int. Cl.³ G01V *1/40*
U.S. Cl. 367—82 **16 Claims**



1. In a borehole telemetry system for passing signals in the form of a data signal over an elongated column acting as an acoustic path in the borehole, said acoustic signals having a data component embedded in a high noise background, circuit means for providing a clock synchronization system to operate data signal processing circuitry, which means comprises:

transmitter means for retransmitting a received data signal;

clock means for supplying a clock signal to the transmitter means in close synchronization with a clock used in the transmission of the received data signal;

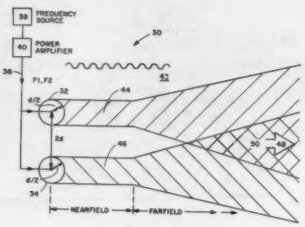
comparator means for determining whether the received data signal occurs before or after the clock signal;

means for shifting the clock signal a small amount in response to the determination of the comparator means; and a separate means for enabling a more rapid shifting of the clock than provided by said first means for shifting signal.

4,320,474
SATURATION LIMITED PARAMETRIC SONAR SOURCE

John M. Huckabay, and Reuben H. Wallace, both of Austin, Tex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1980, Ser. No. 210,096
Int. Cl.³ H04B *1/02*
U.S. Cl. 367—138 8 Claims



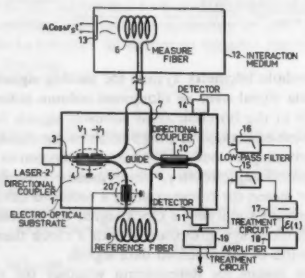
1. In a saturation limited parametric sonar source operating in a nonlinear medium, that improvement for selectively increasing the farfield difference frequency amplitude of a difference frequency beam of sonic energy produced by said saturation limited parametric sonar source which comprises:

a plurality of primary sources having a selected center-to-center spacing each launching a primary beam of sonic energy at least one of said primary beams is a multifrequency beam which is saturation limited, and said center-to-center spacing is selected such that said primary beams first begin to coexist in a common region of said nonlinear medium where spreading and absorption losses reduce the amplitude of said primary beams to a value which precludes saturation; whereby, for each doubling of the number of primary sources implemented, at least a 3 dB increase results in said farfield amplitude of said difference frequency beam of sonic energy.

4,320,475
MONOMODAL OPTICAL FIBRE HYDROPHONE OPERATING BY THE ELASTOOPTICAL EFFECT

Pierre Leclerc; Jean-Pierre Huignard; Michel Papuchon, and Claude Puech, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 26, 1980, Ser. No. 163,190
Claims priority, application France, Jun. 29, 1979, 79 16899
Int. Cl.³ H04R *29/00*
U.S. Cl. 367—149 5 Claims



1. A monomodal optical fibre hydrophone operated by the elastooptical effect comprising;

a monomodal laser source;

an integrated optical circuit substrate coupled to said laser source said circuit having separation means for separating the radiation from said source;

fiirst integrated optical guides for receiving said separated radiation;

recombining means for recombining the radiation guided by a pair of second integrated optical guides;

first monomodal optical fibre forming a measuring arm which is immersed in a first interaction medium exposed to the acoustic wave to be detected;

second monomodal optical fibre forming a reference arm with the ends of said two fibres being rigidly coupled respectively to one of said first and one of said second optical guides;

an electrically controlled phase modulator acting on one of said first integrated optical guides to produce a phase displacement between said guided radiation;

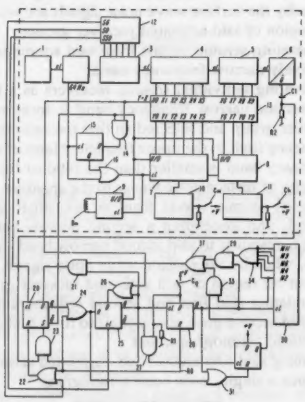
means for detecting the radiation emerging from said recombination means, and

processing means for processing said detected radiation and supplying a control signal to said phase modulator whereby the phase displacement between said two arms is maintained substantially at a point of maximum sensitivity independent of the acoustic wave which is detected and said processing means further supplying a measuring signal characteristic of said acoustic wave.

4,320,476
ELECTRONIC WATCH WITH A DEVICE FOR CONTROLLING AND DRIVING THE DAY OF THE MONTH

Jean-Claude Berney, Epalinges, Switzerland, assignor to Jean-Claude Berney SA, Epalinges, Switzerland

Filed Jun. 28, 1979, Ser. No. 52,749
Claims priority, application Switzerland, Jul. 10, 1978, 7455/78
Int. Cl.³ G04B *19/24*
U.S. Cl. 368—28 9 Claims



1. An electronic watch comprising:

means for generating two trains of time base pulses having different first and second frequencies;

means for counting said first frequency time base pulses;

a bi-directional stepping motor;

motor control means receiving said second frequency time base pulses for generating driving pulses, said motor control means being connected to said motor for control thereof;

means for counting said driving pulses;

an analog display for displaying the time;

a wheel train including a plurality of moving bodies con-

nected to said analog time display and permanently connected to said stepping motor for displaying the time;

a display disc for displaying the day of the months;

a day of the month mechanism coupled to said wheel train for controlling the driving of said display disc, said mechansim disengaging from said wheel train when said moving bodies turn continuously in a clockwise direction and engaging with said wheel train but not acting on said display disc when said moving bodies turn in an anti-clockwise direction;

means for generating a first electrical signal when the position of the display disc is to be modified, said first signal initiating a two part cycle for driving said display disc; and

a control circuit connected to said motor control means, said first frequency time base pulse counting means, said driving pulse counting means and said means for generating said first electrical signal for imposing in response to said first electrical signal a rapid drive rate in an anti-clockwise direction of rotation upon said moving bodies during a first part of said driving cycle to engage said wheel train with said day of the month mechanism and for imposing a rapid drive rate in a continuous clockwise direction of rotation to said moving bodies during a second part of said driving cycle to disengage said wheel train from said day of the month mechanism, said driving cycle being ended by a second electrical signal generated by said control circuit when said first frequency time base pulse counting means and said driving pulse counting means detect said moving bodies have resumed a position corresponding to a display of the correct time by said analog display.

4,320,477
ENERGY SYSTEM FOR ELECTRONIC WATCH

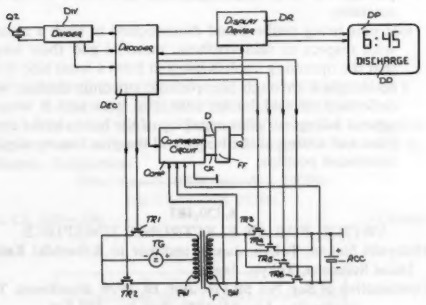
Werner R. Baumgartner, Orpund, Switzerland, assignor to Bulova Watch Co., Inc., Flushing, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,191

Claims priority, application Switzerland, May 16, 1980, 3832/80

Int. Cl.³ G04B *1/00*; H02J *7/00*

U.S. Cl. 368—64 **9 Claims**



1. An energy system for an electronic watch having electronic circuits requiring a predetermined operating voltage and a time display actuated thereby, said system comprising:

(A) a primary power source which, when active, produces an output voltage which differs from the said predetermined voltage;

(B) an energy converter coupled to said source to produce said predetermined voltage for operating said circuits and said display;

(C) a buffer accumulator coupled to the output of the converter and charged thereby:

(D) control means responsive to the condition of said primary source to supply the output of the accumulator to the electronic circuits and to said display to provide operating voltage therefor when the source is inactive; and

(E) a status indicator including detection means to sense the condition of said energy system and to provide a perceptible signal indicative thereof, said detection means including a comparison circuit which compares a voltage derived from the converter with a voltage taken from the accumulator to produce an output from which said signal is derived.

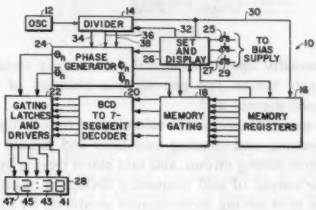
4,320,478
DIGITAL WATCH

Richard G. Daniels; Richard S. Walton, and Roy K. Yamanouchi, all of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 2, 1975, Ser. No. 592,842

Int. Cl.³ G04C *16/00*, *9/00*

U.S. Cl. 368—69 **21 Claims**



1. A digital watch including seconds, minutes, hours, and date time keeping registers for providing a timing operation such that hours and minutes information is both continuously updated and visually displayed, the improvement comprising:

first switch circuit means responsive to an user caused first demand signal for both starting the timing operation and for causing seconds information to be displayed upon command, said first switch circuit means being responsive to the termination of said first demand signal for causing date information to be sequentially displayed for a predetermined time interval;

second switch circuit means responsive to an user caused second demand signal for setting hours information upon command; and

third switch circuit means responsive to an user caused third demand signal for setting both minutes and date information upon command.

4,320,479
ANALOGUE ELECTRONIC TIMEPIECE WITH AN ALARM DEVICE

Mitsuo Sekine, Tokorozawa, and Yasuhiko Nishikubo, Iruma, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 390, Dec. 29, 1978, abandoned. This application Sep. 9, 1980, Ser. No. 185,872

Int. Cl.³ G04B *27/08*

U.S. Cl. 368—74 **9 Claims**

1. An analog electronic timepiece having a crystal controlled oscillator, a frequency divider for dividing the output of said oscillator and producing an output, a driving circuit connected to said frequency divider for producing a pulse signal, a motor operated by said pulse signal, and a hand display device driven by said motor for indicating the current time, the improvement comprising:

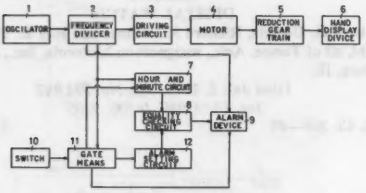
an hour and minute circuit including means for counting the output of said frequency divider to generate an elapsed time duration signal;

an alarm setting circuit including means for memorizing a desired elapsed time duration and providing an output

signal indicative thereof, said alarm setting circuit having a reset state and an alarm set enabling state;

an equality checking circuit connected to said hour and minute circuit and said alarm setting circuit and adapted to produce an output signal when said elapsed time duration signal coincides with the output signal of said alarm setting circuit representing the desired elapsed time memorized;

an alarm device responsive to the output signal of said equality checking circuit;



a manually operated elapsed time setting switch having a single button and providing a plurality of time setting mode signals; and

gate means responsive to said elapsed time setting switch for resetting and clearing said hour and minute circuit, said alarm setting circuit, and said alarm device by controlling the output of said frequency divider in accordance with the time setting mode signals produced by operating said switch, said gate means further setting said alarm setting circuit in response to said time setting mode signals.

4,320,480

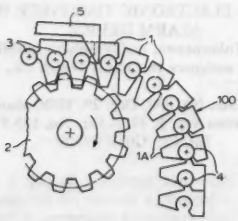
SWITCH CHAIN WITH SWITCH RIDERS FOR SWITCH CLOCKS

Peter Schonhardt, St. Georgen, Fed. Rep. of Germany, assignor to Dieter Graesslin Feinwerktechnik, Fed. Rep. of Germany

Filed May 1, 1980, Ser. No. 145,747

Int. Cl.³ G04B *19/20;* B65H *25/14*

U.S. Cl. 368—78 **12 Claims**



1. A programming apparatus for controlling a switch comprising a continuous linkage of individual elements, respective switch trigger means integrally formed on each said element, a switch actuator means for activation of said switch when engaged with said trigger means, means for driving said linkage past said switch actuator means, and means for interconnecting said elements such that each said element is relatively displaceable laterally of the driving direction of said linkage.

4,320,481

SETTING DEVICE FOR ANALOG-DISPLAY MOTOR VEHICLE CLOCKS

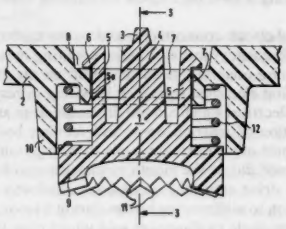
Paul Höfert, Frankfurt am Main, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 15, 1980, Ser. No. 112,374

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1979, 2901634

Int. Cl.³ G04B *27/02, 29/00*

U.S. Cl. 368—190 **10 Claims**



1. In a setting device for analog-display motor vehicle clocks having an operating knob made of injection-molded synthetic material, which knob is rotatably mounted and elastically displaceable axially within a central passage opening in a cover glass from a front side against the action of a spring, the knob being provided with a driving means for engagement into a pointer shaft, the improvement wherein

the operating knob includes the driving means and at least two pins, said pins have grappling hooks, said operating knob including said driving means and said pins are formed integrally in one-piece and made of synthetic material,

said passage opening in the cover glass is cylindrical,

the pins have a cross-section in the form of circular segments complementary to the passage opening constituting guiding surface means for guiding said operating knob in said passage opening in an operating condition axially and rotatably,

said pins being resilient and dimensioned in such a manner with respect to said synthetic material and their length that the operating knob is inserted from a front side of the cover glass through the passage opening therein with deflection of said hooks with said pins and is secured against falling out after engaging of the hooks in the cover glass and setting of the hooks and the pins into an original unstressed position.

4,320,482

SWITCH FOR AN ELECTRONIC TIMEPIECE

Hideyuki Nakao, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Continuation of Ser. No. 50,126, Jun. 19, 1979, abandoned. This application Jan. 23, 1981, Ser. No. 227,726

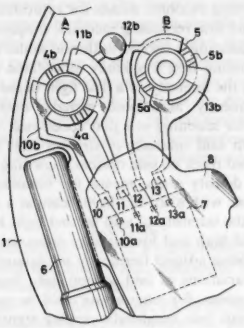
Claims priority, application Japan, Jun. 27, 1978, 53-77613

Int. Cl.³ G04B *17/12, 29/00*

U.S. Cl. 368—201 **3 Claims**

1. In an electronic timepiece: a circuit board; an integrated electronic timepiece circuit on said circuit board and which performs frequency division, said timepiece circuit having a plurality of terminals for controlling frequency division within said timepiece circuit according to external connections made to said terminals; a base plate opposite said circuit board; means comprised of a plurality of mechanical switches including at least one rotary switch connected to said terminals for making a number of different external connections to said terminals which exceeds the sum of the different possible switch settings of the respective individual switches of said

plurality of mechanical switches, wherein said rotary switch is comprised o a conductive rotor having at least a pair of projections facing said circuit board, a driving member fixed to said conductive rotor and mounting said conductive rotor on said circuit board for rotation with said projections contacting said circuit board, said driving member having a slot or non-circuit hole therein to facilitate rotation of said driving member for rotating said rotor, and circuit patterns on said circuit board for defining switch contacts and positioned for contacting said projections of said conductive rotor when said conductive



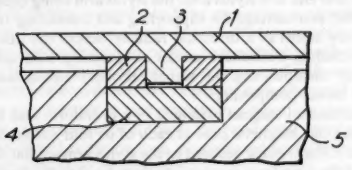
rotor is rotated to certain positions, wherein the respective ones of said switch contacts contacted by said projections of said rotor are determined by the position of said rotor and are changeable by rotation of said rotor, and an elastic member between said rotor and said base plate for urging said conductive rotor against said circuit board to keep said conductive rotor projections in contact with said switch contacts on said circuit board; and means electrically connecting said circuit patterns to respective ones of said timepiece circuit terminals for changing the external connections to said terminals by rotation of said conductive rotor.

4,320,483

ATTACHING DEVICE OF A DIAL ON STATIONARY PARTS OF A TIMEPIECE MOVEMENT

Cyril Vuilleumier, Bienne, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Apr. 9, 1979, Ser. No. 28,284
Int. Cl.³ G04B *19/06*
U.S. Cl. 368—236 **5 Claims**



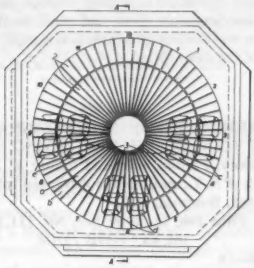
1. An attaching device for attaching a dial to a timepiece movement bottom plate comprising at least one magnetic circuit having at least a permanent magnet, said magnet circuit comprising a first element fixed to the dial and a second element fixed to the movement, one of said elements being said permanent magnet, said elements being arranged and adapted to obtain a magnetic attraction therebetween.

4,320,484

ELECTRO-OPTICAL ANALOG DIGITAL DISPLAY

Michel Burdet, Evilard, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Jun. 10, 1980, Ser. No. 158,102
Claims priority, application Switzerland, Jun. 13, 1979, 5550/79
Int. Cl.³ G04C *17/00*
U.S. Cl. 368—239 **6 Claims**



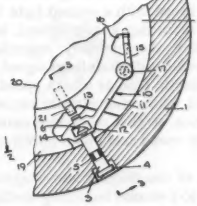
1. Electro-optical passive timepiece display comprising a first display cell, a second display cell superposed on said first display cell and located in a different plane therefrom, said first cell comprising analog time indicating means and said second cell comprising an alpha-numeric or digital indicator, wherein said first and second cells are simultaneously excited, said second cell comprising at least three display zones one only thereof being activated, the zone thus activated being determined by the position of said analog time indicating means in a manner to avoid a superpositioning of the information being displayed.

4,320,485

MANUALLY-ACTUATED CONTACT SWITCH ARRANGEMENT FOR ELECTRONIC WATCH

Werner R. Baumgartner, Finkenweg 12, 2552 Orpund, Switzerland

Filed Jan. 18, 1980, Ser. No. 113,291
Claims priority, application Switzerland, Feb. 2, 1979, 966/79
Int. Cl.³ G04B *29/00*; H01H *3/12*
U.S. Cl. 368—308 **10 Claims**



1. In an electronic watch provided with a case within which is fitted a base plate carrying an electronic circuit board and a contact extending therefrom, a manually-operated switch arrangement which when actuated, connects said contact to said case to complete a circuit effecting a command or setting function, said arrangement comprising:

A. a push member received within a bore in said case and having an outer end accessible to the user of the watch

whereby the member may be pushed inwardly, said member having a lateral slot adjacent its inner end; and

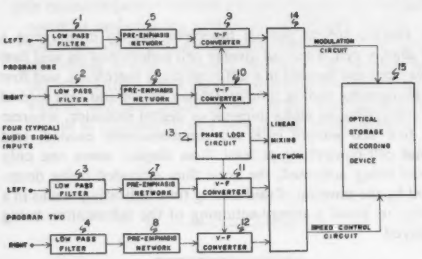
B. a return spring so anchored on the base plate that its free end portion is selectively movable in the direction of the principal plane of the base plate and in a direction normal thereto, the free end portion having a section thereof seated in the slot of said member to exert an initial tension thereon in the axial direction to hold the push member in a predetermined rest position whereby when the push member is manually depressed by the user against this tension, the free end portion of the return spring is caused to engage said contact to complete a circuit to said case to effect said command or setting function, said return spring being disengageable from said push member by moving said free end portion in a direction normal to the principal plane of the base plate.

4,320,486

TRANSFERRING INFORMATION SIGNALS FROM A FIRST TO A SECOND RECORDING MEDIUM

Leslie F. Cooley, Farmingville, and Rainer K. Zopfy, Ronkonkoma, both of N.Y., assignors to Advanced Integrated Design, Incorporated, Bohemia, N.Y.

Filed Jan. 11, 1980, Ser. No. 111,190
Int. Cl.³ G11B *13/04*
U.S. Cl. 369—14 **22 Claims**



1. A method of high-speed preparation of audio cassette tapes from a master recording on which audio information is contained, comprising the steps of reproducing the master recording at a master playback speed; angularly modulating a carrier with the reproduced audio information; providing relative rotation at a first speed between an optical recording medium and a first light beam incident thereon while modulating the intensity of said first light beam as a function of the angularly-modulated carrier, thereby producing an intermediate recording of said audio information on said optical recording medium; optically scanning said optical recording medium having said intermediate recording thereon at a second, substantially higher speed with a second light beam to reproduce the intermediate recording at said second, higher speed; angularly demodulating the optically reproduced intermediate recording to provide a demodulated signal; and advancing at least one said cassette tape at a high speed corresponding to said second speed while magnetically recording the demodulated signal thereon, so that when said cassette tape is played back at its normal speed said audio information will be reproduced.

13. A method of transferring audio signals from a first recording medium to a second recording medium comprising the steps of reproducing said audio signals from said first recording medium; modulating a carrier with said reproduced audio signals thereby to produce corresponding first frequency modulated signals, controlling the intensity of a first light beam with said first frequency modulated signals, scanning at a first speed an intermediate optical recording means with said intensity-controlled first light beam by controllably moving said first light beam across a surface of said optical recording means to produce a record track having high and low density areas, scanning said optical recording means with a second light beam at a second, higher speed to vary the intensity of said second light beam in accordance with said high and low density areas; deriving second frequency modulated signals from the intensity variations of said second light beam; converting said second frequency modulated signals into amplitude-varying signals; and advancing said second recording medium at an above-normal speed while recording said amplitude-varying signals on said second recording medium at said second higher speed.

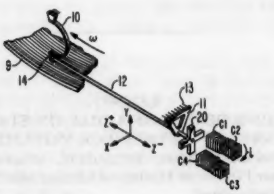
14. Apparatus for transferring audio signals from a first recording medium to a second recording medium comprising said first recording medium; means for reproducing said audio signals from said first recording medium; frequency modulator means for modulating a carrier with said audio signals to produce corresponding first frequency modulated signals; means for controlling the intensity of a first light beam in response to said first frequency modulated signals; optical recording means; means for scanning at a first speed said optical recording means with said intensity-controlled first light beam to produce a record track on said optical recording means having high and low density areas; means for scanning said optical recording means with a second light beam at a second higher speed to vary the intensity of said second light beam in accordance with said high and low density areas scanned thereby; means for deriving second frequency modulated signals from the intensity variations of said second light beam; frequency demodulator means for converting said second frequency modulated signals into amplitude-varying signals; and means for recording said amplitude-varying signals on said second recording medium at said second higher speed.

4,320,487

VIDEO DISC STYLUS CONTROL APPARATUS

Joseph Guarracini, Lawrenceville, and Vincent J. Ruggeri, Fairview, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 23, 1980, Ser. No. 189,818
Int. Cl.³ G11B *17/00*
U.S. Cl. 369—43 **6 Claims**



1. A video disc player of the type having a base for rotatably supporting a disc record and a signal recovery stylus secured to the first end of a stylus arm, the stylus arm being compliantly mounted in a carriage for supporting and translating the signal recovery stylus in a direction radially across the disc record and including transducer means cooperating with said stylus arm for manipulating the signal recovery stylus, said transducer means comprising:

a permanent magnet arranged in a cruciform and having a singular magnetic pole at each of its four extremities, said cruciform being secured to the stylus arm so that the plane of the cruciform is substantially normal to the longitudinal axis of the stylus arm;

four electric coils fixedly secured to said carriage, one coil being arranged proximate each of the cruciform extremities, so that the axes of the respective coils are generally normal to the plane of the cruciform, each coil having respective input terminals for applying energization currents thereto; and

circuit means having respective input terminals for applying

radial, tangential and normal control signals, and having four output terminals respectively connected to each of said four electric coils, said circuit means generating first energization signals applied to the coils laterally disposed on either side of the center of the cruciform responsive to said radial control for producing movement of the stylus only in the direction radially across the disc, generating second energization signals applied to the coils vertically disposed above and below the center of the cruciform responsive to said normal control signals for producing stylus movement only in the direction normal to the disc, and generating third energization signals to at least one pair of coils oppositely disposed about the center of the cruciform responsive to said tangential control signal for producing stylus movement only in the direction tangential to a generally circular track on the disc and wherein simultaneous application of the tangential, normal and radial control signals result in superposition of the respective first, second and third energization signals applied to the respective coils.

4,320,488

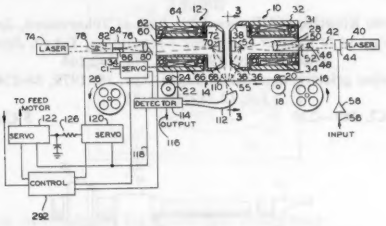
RECORDING AND PLAYBACK SYSTEM

James T. Russell, Richland, Wash., assignor to Digital Recording Corporation, Wilton, Conn.

Division of Ser. No. 556,780, Mar. 10, 1975, abandoned. This application Aug. 21, 1978, Ser. No. 935,152

Int. Cl.³ G11B *7/12, 21/10;* H04N *5/86*

U.S. Cl. 369—44 **17 Claims**



1. Reproducing apparatus comprising:

an elongate record medium in the form of a radiation readable strip having a plurality of information bearing tracks extending crossways of said strip, each track comprising a series recorded plurality of small closely spaced information spots representing digital bits wherein each track contains a number of information spots and means for driving said strip in a direction longitudinal thereof,

a source of electromagnetic radiation,

an optical scanner positioned adjacent the path of said strip, said scanner being disposed in juxtaposition with said strip and including a rotatable head mounting a plurality of lenses for scanning a path of said electromagnetic radiation across said strip according to the plurality of information bearing tracks extending crossways of said strip,

low inertia optical deflection means for deflecting said radiation path relative to said scanner in a direction along said strip crossways of said tracks for producing rapid movement of said radiation path as compared with the longitudinal movement of said strip,

detector means receiving outputs from said tracks via said radiation path, including means for energizing said low inertia optical deflection means to deflect said radiation path continuously and directly towards a track in response to detection of a track,

and means for receiving plural outputs from said detector means representative of plural tracks and for combining said plural outputs into a stream of digital output information.

4,320,489

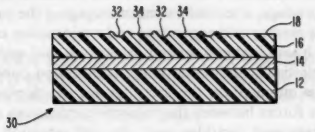
REVERSIBLE OPTICAL STORAGE MEDIUM AND A METHOD FOR RECORDING INFORMATION THEREIN

Richard S. Crandall, Princeton, and Allen Bloom, East Windsor, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 3, 1980, Ser. No. 126,706

Int. Cl.³ G11B *7/26*

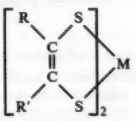
U.S. Cl. 369—111 **11 Claims**



1. A reversible optical recording medium for use in an optical recording and readout system, operating at a specific wavelength, which comprises:

an electrically conductive layer;

a light absorptive layer overlying the conductive layer and comprising a frostable thermoplastic material containing an organometallic compound selected from the group consisting of metal complexes of substituted ethylene dithiols having the structure



where M is Pt, Pd, or Ni and R and R' are independently alkyl, phenyl or substituted phenyl groups; and

wherein the organometallic compound absorbs light of said wavelength and does not affect the frost properties of the thermoplastic material.

4,320,490

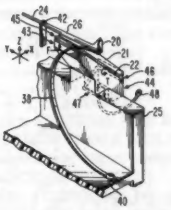
VIDEO DISC CARTRIDGE HAVING A SELF RETAINING ELECTRODE

George H. N. Riddle, Princeton, N.J., and Byron K. Taylor, Carmel, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,370

Int. Cl.³ G11B *9/06*

U.S. Cl. 369—126 **4 Claims**



1. A cartridge for a video disc stylus assembly comprising:

a casing having walls defining protective enclosure;

a signal pickup stylus secured to a first end of an elongated stylus arm;

means for mounting a second end of the elongated stylus arm to said cartridge, said means permitting limited pivotal and longitudinal motion of said stylus arm;

first conductive means secured to the elongated stylus arm relatively near the stylus and arranged to move in accor-

dance with stylus movement, said first conductive means having a connection to a terminal on the cartridge.

an appendage to one of said casing walls for receiving a second conductive means and positioning a portion of said second conductive means proximate the first conductive means for forming a variable capacitance therebetween at a point relatively near the signal pickup stylus when said signal pickup stylus is in its play position; and wherein

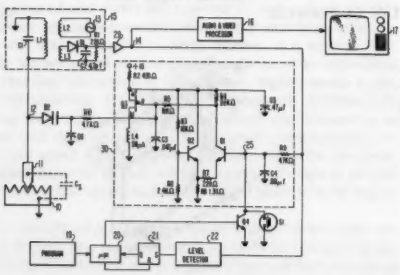
the second conductive means has a first extension engaging the appendage, a second extension engaging the cartridge wall supporting said appendage and a midsection contiguous with said first and second extensions, said midsection being elastically deformed when said second conductive means is mounted on the cartridge for developing compressive forces between the respective extensions and the appendage and cartridge wall for self retention of the second conductive means securely thereto.

4,320,491

APPARATUS FOR VIDEO DISC STYLUS ELECTRODE RECONDITIONING

James C. Rustman, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 19, 1980, Ser. No. 188,888
Int. Cl.[3] H04N 5/80; G11B 9/06
U.S. Cl. 369—126 **11 Claims**



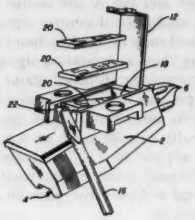
1. A record playback apparatus of the type wherein prerecorded information is recovered from a conductive disc record by a signal pickup stylus having a conductive electrode thereon and said conductive electrode is nominally electrically insulated from said disc, including means for controllably removing a portion of said electrode most nearly adjacent said conductive disc during normal disc playback by creating an electric discharge between said electrode and said disc.

4,320,492

VARIABLE WEIGHT PHONOGRAPH CARTRIDGE

Norman H. Dieter, Jr., Pleasantville, and Sanford Drelinger, White Plains, both of N.Y., assignors to Micro-Acoustics Corporation, Elmsford, N.Y.

Filed Apr. 1, 1980, Ser. No. 136,319
Int. Cl.[3] G11B 3/16
U.S. Cl. 369—170 **11 Claims**



1. In a phonograph cartridge having a transducer and an enclosure, the improvement comprising:

the enclosure having a compartment for receiving a number of weights; and

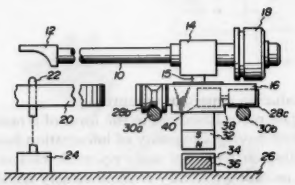
a grip in the compartment for retaining each weight.

4,320,493

LINEAR TRACKING ARM ASSEMBLY WITH ELECTRIC BRAKE

Takashi Kikuchi, and Tsuneo Ishii, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 14, 1980, Ser. No. 142,144
Claims priority, application Japan, Apr. 18, 1979, 54-47412
Int. Cl.[3] G11B 3/38
U.S. Cl. 369—220 **5 Claims**



1. A linear tracking arm assembly for linearly tracking a recording medium carrying thereon audio or video information in response to lead-in and return indication signals, which assembly comprises;

recording medium drive means for driving said recording medium in a predetermined manner;

support and guide means fixedly positioned in conjunction with said recording medium, said support and guide means comprising a pair of guide rails spaced apart from and coextensive with each other and extending in a predetermined direction with respect to said recording medium drive means;

conveyor means to engaged with said support and guide means as to be linearly movable substantially in parallel with said predetermined direction, said conveyer means including a support body and at least three rollers rotatably mounted on said support body, at least one of said rollers being rollable on one of said guide rails and the remaining rollers being rollable on the other guide rail so that said support body is movable along said guide rails;

a pick-up arm movable with said support body;

electro-magnetic drive means connected to said conveyer

means, for moving said conveyer means linearly along guide rails in response to a drive signal;

a speed sensor mounted on said conveyer means, for producing a speed signal according to the detected speed; and

control means connected to said electro-magnetic drive means, for producing said drive signal in accordance with said lead-in and return indication signal and a deviation signal;

a deviation detector mounted on said conveyer and connected to said control means, for producing said deviation signal in accordance with deviation of said pick-up arm with respect to said support body; and

electric brake means connected to said speed sensor and said control means, for modifying said drive signal in response to said speed signal so as to apply a brake to said conveyer means.

4,320,494

SWITCH DEVICE FOR A TURNTABLE

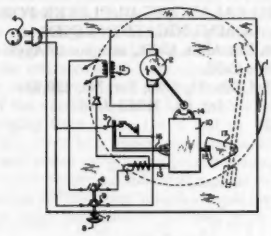
Rüdiger Lehmann, St. Georgen, Fed. Rep. of Germany, assignor to Dual Gebrüder Steidinger GmbH & Co., St. Georgen, Fed. Rep. of Germany

Filed Mar. 12, 1979, Ser. No. 19,730

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1978, 2810963

Int. Cl.³ G11B *17/02*

U.S. Cl. 369—225 **2 Claims**



1. A switch device for a turntable, comprising

a drive motor,

a turntable operatively driven by said drive motor,

a low voltage solenoid having an armature,

a current supply part being operatively connected to said low voltage solenoid,

a solenoid circuit in which said solenoid is disposed,

a main switch being disposed in a common power supply circuit for said drive motor and said current supply part,

a pick-up arm pivotally mounted to swing in over the turntable,

movement control means for control of the movement of said pick-up arm, said movement control means including a control member connected with said main switch,

said control member of said movement control means being controlled by said armature of said low voltage solenoid by means of said movement control means such that said first control member closes said main switch when said solenoid circuit of said low voltage solenoid is closed, at which said main switch is hold in a stable condition,

control means between the said pick-up arm and the said main switch activatable by the movement of the pick-up arm from its rest position to its scanning position over the said turntable and with it closing the said main switch,

drive connection means between said turntable and said movement control means for driving the latter for the duration of a working cycle by said turntable at which said control member is activated by said movement control means such that said control member opens said main switch at the end of the working cycle,

a first contact pair being disposed in said solenoid circuit for said low voltage solenoid,

a second contact pair being disposed in parallel to said main switch,

a spring-biased operating element for starting the device, actuatable against the spring biasing,

said first and said second contact pairs being connected with said operating element such that both said contact pairs close when said operating element is pressed down against the spring biasing action.

4,320,495

TONE ARM RETURN SYSTEM FOR RECORD PLAYER WITH ECCENTRIC SPINDLE HOLE IMMUNITY

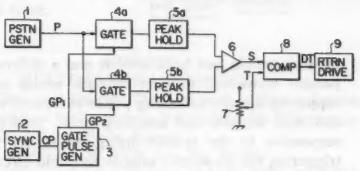
Takashi Kikuchi, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 27, 1978, Ser. No. 890,760

Claims priority, application Japan, Mar. 26, 1977, 52-33880

Int. Cl.³ G11B *17/06*

U.S. Cl. 369—226 **3 Claims**



1. A tone arm return system for a record player, comprising:

(a) means for generating a continuous signal whose amplitude is proportional to the radial position of a pick-up stylus mounted on a tone arm with respect to a spindle in the center of a rotating turntable, the pick-up stylus following a spiral groove in a record disposed on the turntable,

(b) means for generating a train of equally spaced synchronizing pulses individually corresponding to a revolution of the turntable,

(c) means for comparing the maximum or minimum value of the position signal between consecutive first and second synchronizing pulses with the maximum or minimum value thereof, respectively, between consecutive second and third synchronizing pulses, said comparing means comprising a pair of parallel peak or valley holding circuits and a differential comparator connected to their outputs,

(d) gate means responsive to the synchronizing pulses for alternately coupling the position signal to the respective holding circuits, and

(e) means for returning the tone arm to a rest position in response to the comparison value exceeding a predetermined reference value.

4,320,496

TONE ARM RETURN SYSTEMS FOR RECORD PLAYER WITH ECCENTRIC SPINDLE HOLE IMMUNITY

Takashi Kikuchi, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 27, 1978, Ser. No. 890,761

Claims priority, application Japan, Mar. 26, 1977, 52/33881

Int. Cl.³ G11B *17/06*

U.S. Cl. 369—226 **3 Claims**

1. A tone arm return system for a record player, comprising:

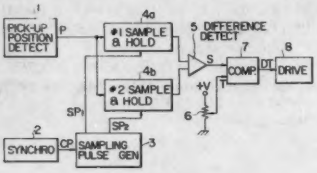
a tone arm, the end of which is movable radially with respect to a spindle at the center of a rotating turntable;

a pick-up stylus mounted on the end of the tone arm and tracking a spiral groove in a record disposed on the turntable;

means for generating a train of equally spaced synchronizing

pulses individually corresponding to a revolution of the turntable, the amplitude of each synchronizing pulse being proportional to the instantaneous radial position of said pick-up stylus, said means for generating comprising a light source and photocell means mounted in spaced relation and movable in accordance with the rotational swing of the tone arm as the pickup stylus tracks the record groove and an apertured shutter plate mounted on the turntable and disposed between said light source and photocell means;

means for comparing the amplitudes of successive synchronizing pulses, said comparing means comprising a pair of



parallel sample and hold circuits and a differential comparator connected to their outputs, means individually supplying the synchronizing pulses to each of said sample and hold circuits and sampling pulse generator means responsive to the synchronizing pulses for alternately triggering the respective sample and hold circuits; and

means for returning the tone arm to a rest position in response to the comparison value exceeding a predetermined reference value, said means for returning comprising a comparator having one input supplied with the comparison value and another input supplied with the reference value, and a tone arm drive device coupled to the output of the last-mentioned comparator.

4,320,497

METHOD FOR TESTING COMMUNICATION PATHS

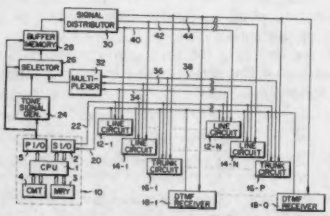
Hideyasu Mori, Hino, and Eizo Kishikawa, Machida, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 6, 1979, Ser. No. 100,879

Claims priority, application Japan, Dec. 7, 1978, 53-151694; Dec. 7, 1978, 53-151695

Int. Cl.³ H04Q *11/04*

U.S. Cl. 370—14 **6 Claims**



1. A method for testing communication paths of an electronic exchange which has at least a pair of time-sharing communicating highways and a plurality of port circuits which are connected to one another in time-sharing fashion through the first and second communication highways, said method comprising:

a first step of detecting at least one of said port circuits which can transfer input signals from the first communication highway to the second communication highway;

a second step of transferring a test signal to said port circuits being detected in the first step through the first communication highway;

a third step of causing one of said plurality of port circuits to deliver the test signal and storing the test signal into memory means through the second communication highway;

a fourth step of reading out the test signal from the memory means through the second communication highway to receiving means, during time slot allotted to the receiving means;

a fifth step of converting the test signal into a coded signal; and

a sixth step of generating a detection signal when the coded signal is not detected within a predetermined time after the test signal has been transferred in the second step.

4,320,498

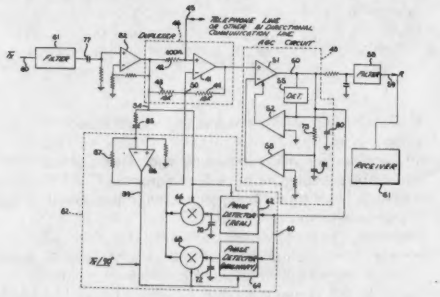
AUTO BALANCING DUPLEXER FOR COMMUNICATION LINES

Gregory Justice, Los Altos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Feb. 11, 1980, Ser. No. 120,134

Int. Cl.³ H04B *1/58*

U.S. Cl. 370—27 **17 Claims**



1. In a communications system employing an isolation means for isolating a transmitted signal from a received signal, a circuit for providing a control signal for said isolation means which reduces the magnitude of said transmitted signal at a receiver, comprising:

phase detection means for detecting the real component and imaginary component of said transmitted signal at the output of said isolation means, said phase detection means coupled to receive said transmitted signal and coupled to said isolation means; and,

modulation means for modulating said transmitted signal with said real and imaginary components from said phase detection means so as to provide said control signal, said modulation means coupled to receive said transmitted signal and coupled to said phase detection means and said isolation means;

whereby a control signal is provided which substantially cancels said transmitted signal at said output of said isolation means.

4,320,499

SYSTEM FOR MULTI-LEVEL DATA TRANSMISSION BY MEANS OF AN ANGLE-MODULATED CARRIER HAVING A CONSTANT AMPLITUDE

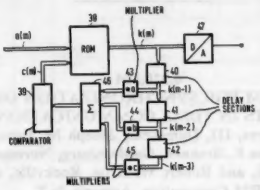
Dirk Muilwijk, Hilversum; Cornelis B. Dekker, and Frank de Jager, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 12, 1980, Ser. No. 129,796

Claims priority, application Netherlands, Mar. 8, 1979, 7901865

Int. Cl.³ H04L *27/18*

U.S. Cl. 375—17 **4 Claims**



1. A system for transmitting n-level data signals from a transmitter to a receiver, the transmitter comprising a carrier oscillator and a modulator connected thereto for generating an angle-modulated carrier having a substantially constant amplitude and a continuous phase, characterized in that the modulator comprises means for converting n-level data signals into intermediate k-level signals wherein k is greater than n, at least one of the n-level data signals having associated therewith two symbols of the intermediate k-level signal, the k-levels of the intermediate multi-level signal corresponding with the phase variations of the carrier signal in one symbol interval of the sequence ranging from $-(k-1)\pi/n$ and to $+(k-1)\pi/n$ in increments of a $2\pi/n$ in a one-to-one relationship and means for causing said phase variations to occur gradually, and that the receiver is formed by a differential n-phase receiver which comprises means for detecting in each symbol interval one out of n different phase variations in multiples of $2\pi/n$.

4,320,500

METHOD OF AND SYSTEM FOR ROUTING IN A PACKET-SWITCHED COMMUNICATION NETWORK

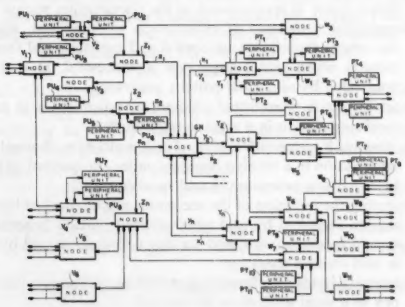
Giulio Barberis; Livio Lambarelli, both of Turin, and Giorgio Micca, Rivoli-Torino, all of Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 25,186, Mar. 29, 1979, abandoned. This application Feb. 8, 1980, Ser. No. 120,109

Claims priority, application Italy, Apr. 10, 1978, 67782 A-78

Int. Cl.³ H04Q *11/04*; H04J *6/00*

U.S. Cl. 370—60 **12 Claims**



11. A method of routing an addressed message packet from a given node in a multinode pocket-switching data-transmission network wherein a plurality of transmitting buffers in said given node are connected to respective outgoing transmission paths extending to a terminal node, at least one of said paths extending over a relay node to said terminal node, comprising the steps of:

at least temporarily storing path delays assigned to message-packet transmission over respective paths extending from said buffers to said terminal node;

calculating, at least partially on the basis of queue lengths at said given node, incremental delays assigned to respective transmitting buffers of said given node;

adding said incremental delays to respective path delays to obtain total delay times assigned to respective transmitting buffers;

comparing said total delay times to determine a minimal total delay time;

routing said packet from said given node over a transmitting buffer and an outgoing path having said minimal total delay time; and

communicating said minimal total delay time to nodes in said network upstream of said given node as seen from said terminal node.

4,320,501

MULTIPLEX SPACE SWITCH

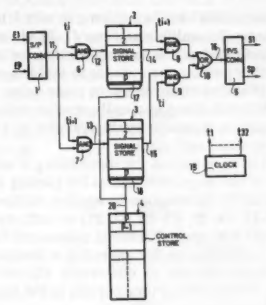
Bernard Le Dieu, and Georges Thiebaut, both of Perros Guirec, France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Oct. 30, 1979, Ser. No. 89,392

Claims priority, application France, Oct. 30, 1978, 78 30715

Int. Cl.³ H04Q *11/04*

U.S. Cl. 370—63 **1 Claim**



1. A multiplex space switch for connecting a plurality p of inlet time division multiplexes to an equal plurality p of outlet time division multiplexes, said inlet and outlet multiplexes being synchronized and in phase and having identical multiple time slot frames, each time slot carrying a binary word having an equal plurality of bits in sequence, wherein the multiplex space switch comprises:

a series to parallel converter having p series inlets for connection to p corresponding inlet multiplexes and a number of parallel outlets equal to the number of bits in a time slot;

two signal stores, each signal store comprising a number of words equal to the product of p multiplied by a sub-multiple x of the total number of time slots in a frame, x being an integer other than one, each frame being divided into n sectors of x time slots per sector, and each signal store being divided into x zones of p words per zone;

a control store comprising nxp words, each word in the control store including an address for one of the p words in any zone and an address for one of said x zones in a signal store;

a parallel to series converter having a number of parallel inputs equal to the number of bits in each time slot and p

series outlets for connection to p corresponding outlet multiplexes; and

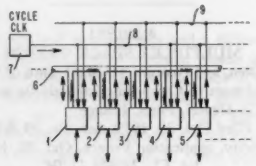
means for operatively connecting the parallel outlets of the series to parallel converter, the parallel inlets of the parallel to series converter, and the control store to both signal stores for alternately reading data from the inlet multiplexes into one signal store while writing data from the other control store into the outlet multiplexes, and vice-versa, the period for each alternate read/write phase being equal to x time slots, whereby the multiplex space switch may perform changes in time slot between the inlet and outlet multiplexes within a given frame sector, in addition to space switching.

4,320,502

DISTRIBUTED PRIORITY RESOLUTION SYSTEM

John A. deVeer, Millbrook, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 22, 1978, Ser. No. 879,987
Int. Cl.³ H04J *6/02*
U.S. Cl. 370—85 **11 Claims**



1. In an information handling system, in which information is transferred between multiple stations (1–5) via a time-shared bus (6), a distributed access control system for enabling said stations to self-determine their access to said bus on a competitive basis, said access control system comprising:

means (7, 8) for defining cyclically repetitive time periods in which said bus is continuously available to transfer information between said stations;

means (23) at each station for manifesting a unique relative priority of the respective station for gaining access to said bus to transfer information to another station;

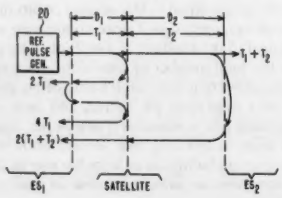
means (20–22, 24, 26, 27, 30, 32, 36) at each station, responsive to said time period defining means and the respective priority manifestation, for operating in isochronal relation to the other stations to effectively allocate the bus in advance of each of said time periods to the highest priority station instantaneously requiring access to said bus.

4,320,503

SYNCHRONIZING TRANSMISSIONS FROM TWO EARTH STATIONS TO SATELLITE

Alfonse Acampora, Staten Island, N.Y., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 6, 1979, Ser. No. 63,808
Int. Cl.³ H04J *3/06*
U.S. Cl. 370—104 **3 Claims**



1. A method of synchronizing transmissions from two earth stations to a satellite so that they are time division multiplexed at the satellite, comprising

transmitting a reference pulse from a first nearer earth station to the satellite and back, twice,

transmitting the same reference pulse from the satellite to the second more distant earth station and back via the satellite to the first earth station, and

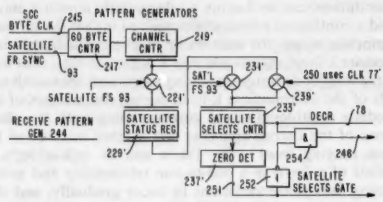
using the returned reference pulses to delay the start of transmission from the first nearer earth station.

4,320,504

MECHANISM FOR SYNCHRONIZATION OF DATA PORTS IN TDMA COMMUNICATION

Joseph A. Alvarez, III, Damascus; Joseph M. Bensadon, Germantown; John F. Brennen, Gaithersburg; Norman F. Brickman, Potomac, and Robert W. Krug, Rockville, all of Md., assignors to IBM Corporation, Armonk, N.Y.

Filed Mar. 7, 1980, Ser. No. 128,321
Int. Cl.³ H04J *3/16*
U.S. Cl. 370—104 **10 Claims**



1. In a TDMA communications system including a plurality of stations which intercommunicate in TDMA mode, each station transmitting a time divided sequence of information channels during an assigned burst period of a TDMA frame, a method for carrying out data activity compression for data sources having a data rate which is a non-integral multiple of the basic data transmission rate for a station, comprising the steps of:

synchronizing a pattern generator in a data port at a sending station with a corresponding pattern generator in a data port at a receiving station;

comparing each byte of data in a multi-byte channel of data in a first frame with the last byte of data in a preceding frame, prior to transmission at the transmitting station;

transmitting a channel of information so compared, when the comparison is not successful and omitting said transmission when said comparison is successful, at a time controlled by said local pattern generator;

receiving each transmitted channel of information at said receiving station in a receive burst buffer;

writing each consecutive byte of said multi-byte channel of information in a receive memory under the control of the local pattern generator in said receive station;

detecting the omission of the reception of a channel of information expected by said synchronized pattern generator in said receive station and writing consecutive null bytes in said receive memory;

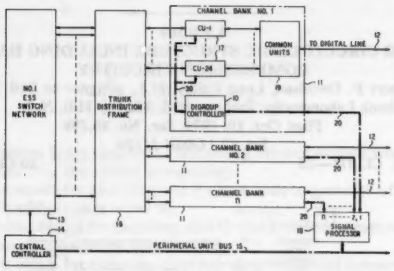
outputting bytes of information stored in said receive memory to a local utilization device and;

replicating the last received byte from the last received channel of information, from said receive memory to said local utilization device when said byte of information is a null byte.

4,320,505
PROCESSING APPARATUS FOR DATA RATE REDUCTION

Philip J. Baun, Jr., Andover, Mass., and Thomas B. Merrick, Atkinson, N.H., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 23, 1979, Ser. No. 59,759
Int. Cl.³ H04J 3/12
U.S. Cl. 370—110 **8 Claims**



1. In a digital transmission system which comprises digital channel banks and wherein a plurality of digital message signals are transmitted between channel banks in a plurality of time division multiplexed channels, the least significant bit of each channel being borrowed for signaling purposes every 6^{th} frame, at least one channel bank (11) having a plurality of channel units (17) interconnected to a controller (10) via a shared data bus (30), each channel unit receiving the signaling information bits of a given channel, each channel unit being characterized by a data processing circuit (FIG. 2) for minimizing the number of signaling data transmissions to the controller over the shared data bus, said circuit comprising means (24–27) for filtering out single bit errors in the received signaling information bits, means (23) for storing the signaling status last reported to the controller, means (28) for comparing the signaling status last reported to the controller with the current status from the output of the filtering means and for reporting (36, 46) the latter to the controller when the compared status signals differ, and means for delaying the reporting of a signaling status change for at least one receive signaling time period of six frames.

4,320,506
APPARATUS AND METHOD FOR SIMULATION TESTING OF AN ANTI-BLOCK SYSTEM

Perry Farazi, Chicago, and Howard L. Frank, Skokie, both of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.

Continuation of Ser. No. 23,463, Mar. 23, 1979, abandoned. This application Aug. 11, 1980, Ser. No. 177,079
Int. Cl.³ G01R 31/28
U.S. Cl. 371—20 **13 Claims**

1. An apparatus for testing an anti-block system of the type including an ABS processor, said ABS processor having at least a first and second input and providing a brake control signal, comprising, in combination:

first signal means for providing a substantially constant frequency signal;

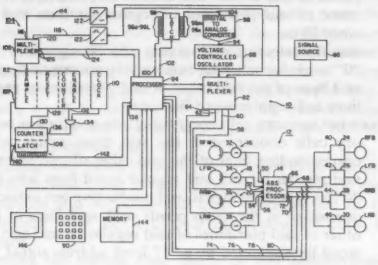
second signal means for receiving a frequency control signal and for responsively providing a variable frequency signal;

third signal means for controllably providing said frequency control signal;

multiplexer means for controllably and selectively interconnecting said first and second inputs of said ABS processor to said first signal means and said second signal means;

display means for displaying an output signal representative of said brake control signal of said ABS processor; and

processor means for controlling said third signal means and said multiplexer means in accordance with a predetermined sequence, for receiving said brake control signal from said ABS processor, and for responsively providing said output signal to said display means, whereby said first

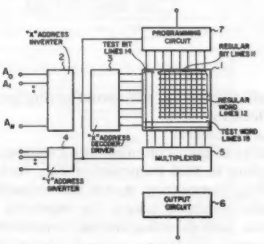


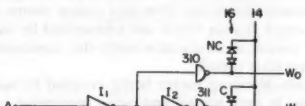
and second inputs of said ABS processor receive said substantially constant frequency signal and said variable frequency signal in accordance with said predetermined sequence, said ABS processor responsively provides said brake control signal, and said output signal, representative of said brake control signal, is displayed for analysis thereof.

4,320,507
FIELD PROGRAMMABLE DEVICE HAVING TEST PROVISIONS FOR FAULT DETECTION

Toshitaka Fukushima, Yokohama; Kazumi Koyama, Kanagawa, and Kouji Ueno, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 19, 1979, Ser. No. 95,782
Claims priority, application Japan, Nov. 25, 1978, 53-145829
Int. Cl.³ G06F 11/22; G01R 31/26
U.S. Cl. 371—21 **7 Claims**





1. A field programmable device having a memory array member comprising:

a plurality of regular bit lines,

a plurality of regular word lines defining cross points with said plurality of regular bit lines,

regular memory cells connected at respectively associated

cross points between said plurality of regular bit lines and said plurality of regular word lines,

at least one test line adjacent a corresponding one of said pluralities of said regular bit lines and said regular word lines and defining cross points with the lines of the other of said pluralities of regular bit lines and regular word lines,

test memory cells respectively connected at the said cross points of said at least one test line and said lines of the said other of said pluralities of regular bit lines and regular word lines,

means for selectively supplying address signals of "1" and "0" levels for selecting respectively corresponding ones of said lines of the said other of said pluralities of regular bit lines and regular word lines, and

said test memory cells comprising non-conductive test memory cells connected at the said cross points with said corresponding lines of the said other of said pluralities of said regular bit and said regular word lines selected by a "0" level address signal, and conductive test memory cells connected at the cross points with said lines of the said other of said pluralities of said regular bit and said regular word lines selected by a "1" level address signal.

4,320,508

SELF-DIAGNOSING, SELF-CORRECTING COMMUNICATIONS NETWORK

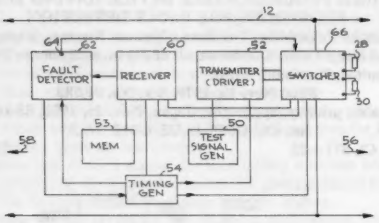
Fumihiko Takezoe, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1980, Ser. No. 137,281

Claims priority, application Japan, Apr. 6, 1979, 54-41842

Int. Cl.³ G06F *11/00*; H04B *17/00*

U.S. Cl. 371—22 **10 Claims**



1. A self-diagnosing, self-reconfiguring communication network, which includes:

a transmission line;

a plurality of inter-communicating stations each adapted for coupling to said transmission line, each such station including transmitting means for transmitting information signals, receiving means for receiving said information signals, fault detecting means, terminating means, switching means, and timing means for controlling said transmitting and receiving means;

said transmitting means including a check signal generator responsive to signals from said timing means for generating check signals which are transmitted by said transmitting means in connection with the transmission of said information signals;

said fault detecting means being coupled to said receiving means in each station and being responsive to a garbled, received check signal to produce a fault signal;

said switching means being coupled to said transmission line, to said transmitting means, to said receiving means, to said fault detecting means and to said terminating means and being responsive to a fault signal from said fault detecting means to terminate said transmission line, sequentially in a first direction for a first period and in a second direction for a second period;

said transmitting means including test signal generating means and being responsive to a fault signal from said fault detecting means for transmitting a test signal in said first direction during said first period and in said second direction during said second period to produce first and second response signals, respectively, at said receiving means;

said fault detecting means being coupled to said receiving means and being responsive to a difference between said test signal and said response signals received from said transmission line in response to said test signal transmitted in said first and second periods, respectively, to produce a switching signal;

4,320,509

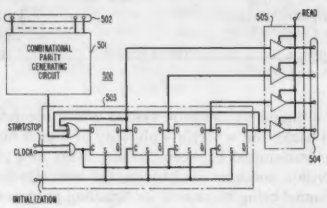
LSI CIRCUIT LOGIC STRUCTURE INCLUDING DATA COMPRESSION CIRCUITRY

Robert P. Davidson, Long Valley, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 19, 1979, Ser. No. 86,299

Int. Cl.³ G06F *11/26*

U.S. Cl. 371—25 **10 Claims**



1. An LSI circuit logic structure for improved testability comprising a plurality of terminals (**104**), a plurality of functional parts (**101, 105, 106, 108, 109, 110, 111**) interconnected at a multiplicity of internal nodes (**113, 114, 115, 116, 117, 118**) and clock generating circuit means (**108**) for providing a sequence of clock pulses;

characterized in that there are included spatial data compression means comprising combinational parity generating circuit means (**201, 501, 601, 602, 603**) coupled to selected ones of the internal nodes and responsive to signals on the selected ones of the internal nodes for deriving a parity signal, temporal data compression means comprising sequential signature generating circuit means (**204, 503, 608**) responsive to the sequence of clock pulses for sampling the parity signal over a fixed interval of time and for generating and storing a signature word of a predetermined length, and output means (**211, 505, 609**) for transferring the signature word from the signature generating circuit means to selected ones of the terminals.

4,320,510

ERROR DATA CORRECTING SYSTEM

Tadashi Kojima, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 29, 1980, Ser. No. 116,555

Claims priority, application Japan, Jan. 31, 1979, 54-10101; Jan. 31, 1979, 54-10102; Jan. 31, 1979, 54-10103

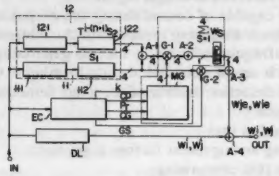
Int. Cl.³ G06D *11/10*

U.S. Cl. 371—37 **4 Claims**

1. An error data correcting system in which a group of n data words (W_1) through (W_n) each including m bits has associated therewith a P check code

$$\left(P = \sum_{r=1}^{n} W_r\right)$$

and a Q check code



$$\left(Q=\sum_{r=1}^{n}\gamma^{(n+1)-r}W_r\right)$$

the system being capable of correcting erroneous data words W_{ie} and W_{je}, the system comprising:

first means for decoding said P check code to generate a first syndrome data word S_1;

second means for decoding said Q check code to generate a second syndrome data word S_2;

first means for summing corresponding bits in said syndrome data words S_1 and S_2 to produce a syndrome sum data word;

M matrix generator means for generating an M matrix corresponding to $M(x)=X^m+X^g+1$;

means for controlling said M matrix generator means to produce M matrix selector signals;

second means for summing said syndrome sum data word and said M matrix selector signal to generate a first intermediate data word W_{jc};

third means for summing W_{je} and S_1 to generate a second intermediate data word, W_{ic}; and

means for combining (1) the data words W_{je} and W_{jc} to produce corrected data word W_j, and (2) the data words W_{ie} and W_{ic} to produce the corrected data word W_i.

4,320,511

METHOD AND DEVICE FOR CONVERSION BETWEEN A CYCLIC AND A GENERAL CODE SEQUENCE BY THE USE OF DUMMY ZERO BIT SERIES

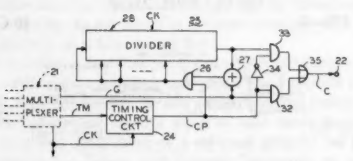
Keiichiro Koga, Urawa; Yutaka Yasuda, Tanashi; Ryokichi Saga, Tokyo, and Yukio Takimoto, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd. and Nippon Electric Co., Ltd., both of Tokyo, Japan

Filed Mar. 11, 1980, Ser. No. 129,486

Claims priority, application Japan, Mar. 13, 1979, 54-28217; Mar. 13, 1979, 54-28218; Mar. 13, 1979, 54-31216[U]

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—37 **5 Claims**



1. A method of carrying out conversion for encoding/decoding for error detection/correction between a cyclic code sequence and a general code sequence, said cyclic code sequence lasting a duration determined by a burst, each of said cyclic and said general code sequences consisting of a plurality of normal code blocks and an additional code block arranged in a predetermined order, each of the normal code blocks of said cyclic code sequence consisting of a normal cyclic code of a first predetermined number of data bits followed by a second predetermined number of check bits, the additional block of said cyclic code sequence consisting of an additional cyclic code of a variable number of data bits followed by check bits, said variable number being less than said first predetermined number and dependent on said burst, the check bits of said additional cyclic code being equal in number to said second predetermined number, each of the normal code blocks of said general code sequence being for data bits followed by a prescribed period, the additional code block of said general code sequences being also for data bits followed by a like prescribed period, the data bits in the normal and the additional code blocks of said general code sequence being equal in number to said first predetermined and said variable numbers, respectively, said prescribed period being for arranging a plurality of check bits, equal in number to said second predetermined number, but being free of the last-mentioned check bits, said method comprising the steps of:

establishing code block periods of the normal code blocks of a predetermined one of said cyclic and said general code sequences and an additional code block period of the additional code block of said predetermined code sequence;

converting the normal code blocks of said predetermined code sequence to the normal code blocks of the other of said cyclic and said general code sequences, respectively, when said normal code block periods are measured;

and

converting the additional code block of said one code sequence to the additional code block of said other code sequence when said additional code block period is established, said additional code block converting step being carried out by assuming that the data bits in the additional code block of said predetermined code sequence is preceded by a dummy zero bit series of a data length equal to a difference between said first predetermined number and said variable number.

4,320,512

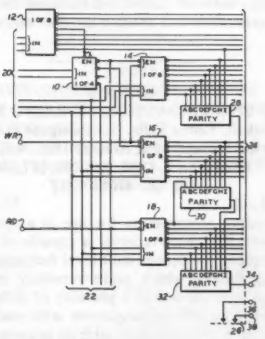
MONITORED DIGITAL SYSTEM

Jay L. Richman, Montville, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Jun. 23, 1980, Ser. No. 162,274

Int. Cl.³ G06F *11/12*

U.S. Cl. 371—52 **12 Claims**



1. A monitored digital system operable to determine a system failure, comprising:

strobing means having a plurality of output lines for generating a singular signal on one of said plurality of lines; and

error detection means coupled to said plurality of lines for producing an error signal in response to said singular signal being produced on two of said plurality of lines, said error detection means including:

first and second matching circuits each having a plurality of data inputs and a check output, said data inputs of said first

circuit being separately connected to at least one of said output lines and to said check output of said second matching circuit, a signal being provided on said check output of said second matching circuit in dependence on those of said output lines connected thereto and bearing said singular signal, but not in dependence on the other ones of said output lines.

4,320,513
ELECTRIC CIRCUIT FOR THE PRODUCTION OF A NUMBER OF DIFFERENT CODES

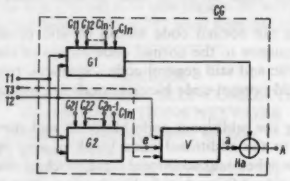
Ernst Lampert, Unterpfaffenhofen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 11, 1972, Ser. No. 252,933

Claims priority, application Fed. Rep. of Germany, May 17, 1971, 2124320

Int. Cl.³ G06F 7/58

U.S. Cl. 375—1 **7 Claims**



1. An electric circuit, in particular for devices and systems operating in accordance with SSMA techniques, for the production of a number of different codes according to a linear law of formation, which codes have practically negligible values of cross correlation and also negligible values of auto correlation coefficients when regarding out of phase values of at least one code element, comprising a pair of basic code generators each of which includes a linear sequential network comprising and formed of interconnected half adders and shift register stages, an additional half adder and at least one delay network, said additional half adder connected to said delay network and forming an output circuit, one of said basic code generators connected to an input offset additional half adder and said delay network connected between the other of said basic code generators and another input of said additional half adder.

4,320,514
SPREAD SPECTRUM FH-MFSK RADIO RECEIVER

Barin G. Haskell, Tinton Falls, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 9, 1980, Ser. No. 157,266

Int. Cl.³ H04B 7/12

U.S. Cl. 375—1 **5 Claims**

1. A decoding arrangement for use in a spread spectrum radio receiver (30) which receiver is capable of receiving one or more frequency-hopping, multilevel frequency shift keyed (FH-MFSK) signals which were remotely transmitted by modulating a separate one of a plurality of different L-length frequency-hopping address sequences with each user's separate signal sample wherein each address sequence comprises a sequence of L chip periods with each chip period including a code for one of Q possible frequencies, and signal sample is encoded as one of said Q possible frequencies; the decoding arrangement comprising:

spectrum analyzing means (36) capable of generating, in response to a received signal, an output signal indicating the presence on absence of each of the possible Q frequencies in the received FH-MFSK signal during each chip period of the L-length sequence;

frequency-hopping address generating means (38) capable of generating an L-length frequency-hopping address sequence associated with a particular user in synchronism with the received L-length signal; and

means (42) capable of demodulating the output signal from the spectrum analyzing means with the address sequence from the frequency-hopping address generating means to generate a set of decoded signals forming a Q level by L-length detection matrix of received demodulated message signals

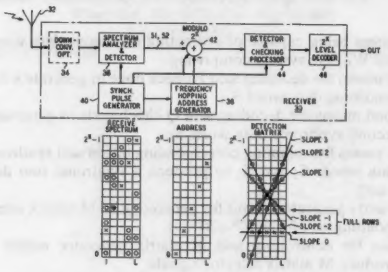
characterized in that

the decoding arrangement further comprises:

a processor (44) comprising:

means (60_1–60_L) capable of storing the set of decoded signals forming a detection matrix of interest, and

means (62_1–62_L, 64 and 66) capable of determining which of



the Q levels of the set of decoded signals in the detection matrix of interest stored in said storing means have a maximum number of frequency presence indications over the L-length decoded sequence and (a) in response to an indication that only one level has a maximum length, generating an output signal indicative of that level as the particular user's correct message, and (b) in response to an indication that multiple levels have an equal maximum length, checking each maximum-length level by using the address sequences of all users other than the particular user to both determine if the frequency indications in each maximum-length level could have been produced by said other users and generate an output signal indicative of the level with the least number of matches by other users as the particular user's correct message.

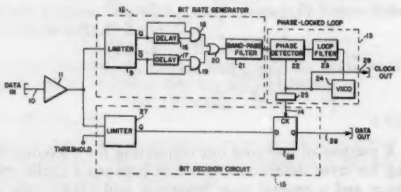
4,320,515
BIT SYNCHRONIZER

Willie T. Burton, Jr., Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Mar. 7, 1980, Ser. No. 128,147

Int. Cl.³ H04L 25/52

U.S. Cl. 375—4 **16 Claims**



1. In a circuit arrangement for synchronously regenerating data signals applied thereto comprising:

first means, coupled to receive said data signals and to produce an output signal representative of the data rate of said data signals;

a phase locked loop, coupled to said first means, for produc-

ing a clock signal the frequency of which corresponds to the data rate of said data signals and being synchronized with said data signals; and

second means, coupled to receive said data signals and the clock signal produced by said phase-lock loop, for producing output data signals, information values in which correspond to those contained in the received data signals and are synchronized with the clock signal produced by said phase lock loop, the improvement wherein

said first means comprises

limiter means, coupled to receive said data signals and to produce first and second outputs representative of the respective states thereof,

a logic decision circuit coupled to logically combine the first and second outputs produced by said limiter means, and

a bandpass filter, coupled between said logic decision circuit and said phase lock loop.

4,320,516

CIRCUIT FOR ASCERTAINING OF THE PHASE JITTER OF DIGITAL SIGNALS

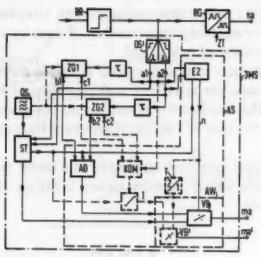
Karl Kammerlander, Wolfratshausen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 10, 1979, Ser. No. 83,299

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1978, 2846271

Int. Cl.³ H03B *3/04*

U.S. Cl. 375—10 **28 Claims**



1. A circuit for ascertaining the phase jitter of an incoming signal which includes at least portions in digital form at the receiving side of a signal transmission link comprising:

a differentiating circuit for converting the transitions of the incoming digital signal to a series of pulses of a selected polarity on a first output line;

a free-running function generator which produces a selected periodic time function and which has a control input;

said first output line of said differentiating circuit is connected to said control input of said function generator such that each pulse of a selected polarity on said first output line resets said function generator to an initial condition;

a means for evaluating;

said means for evaluating is connected to an output of said function generator, said means for evaluating includes means for sensing output values of said function generator simultaneously with the appearance of said pulses from said differentiator and means for calculating a measure of the phase jitter of the incoming signal, said measure comprises a mean value of a plurality of said sensed outputs of said function generator.

4,320,517

METHOD AND DEVICE FOR EFFECTING THE INITIAL ADJUSTMENT OF THE CLOCK IN A SYNCHRONOUS DATA RECEIVER

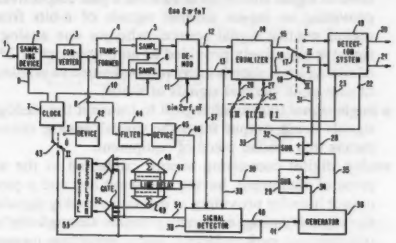
Dominique N. Godard, Le Rouret, and Michel Y. Quintin, La Gande, both of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 3, 1980, Ser. No. 156,140

Claims priority, application France, Mar. 19, 1980, 80 06542

Int. Cl.³ H04L *7/10*

U.S. Cl. 375—13 **8 Claims**



5. In a synchronous data receiver of the type that includes a clock and an adaptive equalizer, a device for effecting the initial adjustment of the clock during a turn-on period in the course of which the receiver receives a clock synchronization signal followed by an equalizer training sequence, characterized in that it includes:

sampling means for sampling the received signal,

storage means for storing signal samples derived from the samples of the received signal, said storage means which includes a plurality of locations, each being capable of storing one of said signal samples,

means for detecting the synchronization signal,

means for detecting the beginning of the training sequence, and

means responsive to the detection, in succession, of the synchronization signal and of the training sequence to derive a control signal for controlling the initial adjustment of the clock from the signal samples stored in predetermined locations in said storage means, starting from the instant the training sequence is detected.

4,320,518

SWITCHING CONTROL SYSTEM

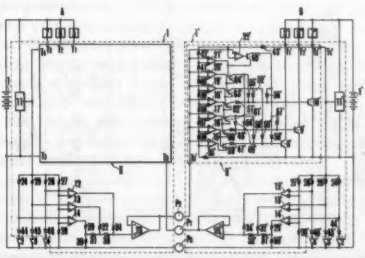
Toshikazu Ichiyanagi, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1979, Ser. No. 105,033

Claims priority, application Japan, Dec. 28, 1978, 53-165845

Int. Cl.³ H04B *1/68*

U.S. Cl. 375—17 **4 Claims**



1. A switching control system comprising:

a digital control signal source, contained in a first piece of equipment, within which source 2^n different control patterns are selectively formed, said source having n-pieces of output lines so as to be able to provide as outputs, in parallel, binary signals being independent from each other using each line, wherein binary signals with combinations corresponding to the control patterns formed at the source are provided as outputs in each of said output lines;

digital/analog converting means, contained in the first piece of equipment, having n-pieces of input lines, each one of which is so connected to each output line of the digital control signal source so as to form a pair respectively, for providing as inputs parallel signals of n-bits from the digital control signal source, wherein one analog level signal is selectively provided as an output out of 2^n kinds of analog level signals in correspondence to a combination of said input parallel signals of n-bits;

a single signal transmission path to transmit the analog level signals being output from the digital/analog converting means to a second piece of equipment;

analog/digital converting means, contained in the second piece of equipment, having one input line and n-pieces of output lines for providing as inputs the analog signals from the digital/analog converting means through the signal transmission path, wherein said converting means provides as outputs, in parallel, binary signals being independent from each other at the n-pieces of output lines in correspondence to the level of the input analog signals, also wherein the combinations of said parallel binary signals correspond one-to-one to said input analog signal level; and

n-pieces of switching means, contained in the second piece of equipment, being so arranged as to be able to control the operation of a plurality of electrical circuits within the second piece of equipment, wherein said switching means are connected respectively so as to correspond to the output lines of the analog/digital converting means, and to have their switching controlled by the output signals of the analog/digital converting means;

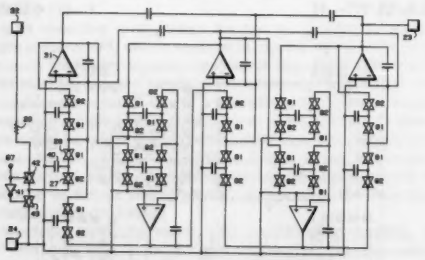
whereby the binary signals of n-bits from the first piece of equipment are transmitted to the second piece of equipment through one single signal transmission path and the operation of the n-pieces of switching means within said second piece of equipment can be controlled so as to be independent from each other.

4,320,519

(SIN X)/X CORRECTION CIRCUIT FOR A SAMPLED DATA SYSTEM

Stephen H. Kelley, Austin, Tex., and Henry Wurzburg, Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 10, 1980, Ser. No. 138,969
Int. Cl.³ H03K *13/32*
U.S. Cl. 375—26 **8 Claims**



1. In a sampled data system which periodically samples an input signal for finite periods and provides such sampled input signal to a switched capacitor filter having an input capacitor, a circuit for correcting (sin X)/X distortion resulting from the sampling, the circuit comprising:

first switching means for selectively coupling, in response to a control signal, the sampled input signal to the input capacitor; and

second switching means for selectively coupling a reference voltage to the switched capacitor filter;

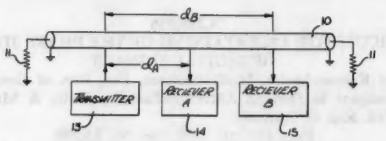
wherein the capacitance of the input capacitor is selected to provide a charge gain which is inversely proportional to the duration of the selective coupling of the sampled input signal to the input capacitor.

4,320,520

TRANSMITTER/RECEIVER FOR USE ON COMMON CABLE COMMUNICATIONS SYSTEM SUCH AS ETHERNET

Martin H. Graham, Berkeley, Calif., assignor to Rolm Corporation, Santa Clara, Calif.

Filed Jun. 27, 1980, Ser. No. 163,573
Int. Cl.³ H04B *3/00*
U.S. Cl. 375—36 **10 Claims**



1. In a data communication system having at least one transmitter and a plurality of receivers, and where said transmitter and receivers are coupled to a common cable at spaced-apart points along said cable, an improvement comprising:

multiple data rate transmission means, coupled to said transmitter for enabling transmission of data by said transmitter at a plurality of rates; and,

selection means, coupled to said multiple data rate transmission means, for selecting said plurality of rates as a function of the bandwidth of said cable between said transmitter and the one of said receivers to which data is transmitted;

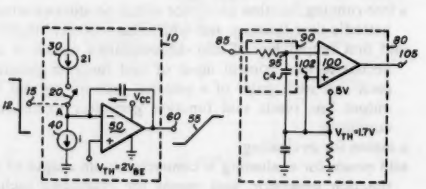
whereby data may be transmitted at a faster rate to receivers which are closer, therby better utilizing the capacity of said cable.

4,320,521

DATA BUS TRANSCEIVER

Ramanatha V. Balakrishnan, Santa Clara, and William R. Fowler, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 25, 1980, Ser. No. 172,346
Int. Cl.³ H03K *4/94*
U.S. Cl. 375—36 **9 Claims**



1. A transceiver circuit for transmitting and receiving digital data on a data bus, the circuit comprising:

trapezoidal driver means responsive to the digital data and coupled to the data bus for applying a trapezoidal signal to the data bus in response to the digital data, the trapezoidal

signal having controlled leading and trailing edge slopes and characterized by a dynamic range and a midpoint voltage;

a low-pass filter for attenuating the high frequencies of a signal received at the input thereof and having an output thereof for providing the attenuated signal;

a threshold voltage source for providing a threshold voltage having an amplitude approximately equal to the midpoint voltage;

a differential receiver having a first input coupled to the output of the low-pass filter and a second input coupled to receive the threshold voltage for providing an output signal having a first value in response to the signal received on the first input having an amplitude greater than the threshold voltage, the output signal having a second value otherwise.

4,320,522

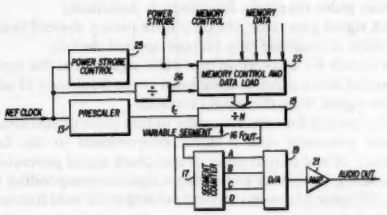
PROGRAMMABLE FREQUENCY AND SIGNALLING FORMAT TONE FREQUENCY ENCODER/DECODER CIRCUIT

David F. Hayes, Webster, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Filed May 9, 1980, Ser. No. 148,289

Int. Cl.³ H03C *3/02;* **H04L** *27/10;* **H03D** *3/06*

U.S. Cl. 375—48 **39 Claims**



7. A tone signalling encoder/decoder device comprising:

a programmable encoder for generating a selected one of a plurality of possible output frequency signals in response to applied frequency select signals, said encoder operating in a selected one of a plurality of possible operating modes, said encoder comprising:

a reference frequency source,

a programmable divider for selectively dividing the output frequency of said reference frequency source,

and

a sine wave generating circuit responsive to the output of said programmable divider for successively providing a predetermined number of sine wave weighted segment signals to form a cycle of a selected output frequency;

a programmable decoder for decoding a selected one of a plurality of possible applied input frequency signals in response to applied frequency select signals, said decoder operating in a selected one of a plurality of possible operating modes; and,

mode control means responsive to applied mode control signals for conditioning said encoder and decoder to operate in a selected one of said plurality of possible operating modes and to operate in a selected one of an encoding and decoding mode.

4,320,523

DIGITAL SIGNAL RECEPTION SYSTEM

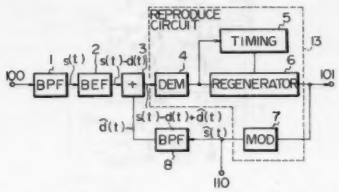
Izumi Horikawa, Yokohama, and Masaaki Shinji, Sekiu, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Feb. 4, 1980, Ser. No. 118,229

Claims priority, application Japan, Feb. 13, 1979, 54-14360

Int. Cl.³ H04B *1/10*

U.S. Cl. 375—103 **15 Claims**



1. A digital signal reception system in a wireless communication system comprising at least an input terminal to which a modulated digital signal is applied, a demodulator for demodulating the modulated digital signal to obtain the baseband thereof, a regenerator coupled to the output of the demodulator for regenerating the digital signal, and an output terminal connected to the output of the regenerator to provide the regenerated digital signal, the improvement comprising, in combination: a band-elimination filter for removing an interference component within the frequency spectrum of the modulated digital signal before regeneration thereof by said regenerator, a bandpass filter coupled to the output of said output terminal, the center frequency of said bandpass filter being the same as that of said band-elimination filter, and an adder for adding the output of said band-elimination filter and the output of said bandpass filter, the output of said adder being coupled to the input of said regenerator.

4,320,524

Patent Not Issued For This Number

4,320,525

SELF SYNCHRONIZING CLOCK DERIVATION CIRCUIT FOR DOUBLE FREQUENCY ENCODED DIGITAL DATA

Thomas R. Woodward, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 29, 1979, Ser. No. 88,947

Int. Cl.³ H03K *13/11*

U.S. Cl. 375—110 **47 Claims**

1. A self-synchronizing circuit for reconstructing the timing information encoded in an incoming double frequency transition-event waveform, said incoming waveform characterized as including both guaranteed and non-guaranteed transitions, said incoming waveform further characterized as having a bit cell duration of T, said circuit arrangement comprising:

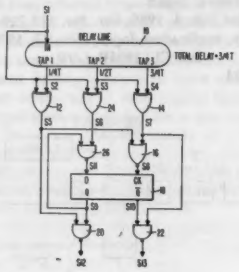
delay line means, responsive to said incoming waveform, said delay line means for generating a set of at least two delayed versions of said incoming waveform;

detecting means, responsive to said incoming waveform and said set of delayed versions of said incoming waveform, said detecting means for detecting each transition in said incoming waveform and producing first and second transition waveforms, each of said transition waveforms identifying each transition in said incoming waveform;

isolating means, connected to said detecting means, said isolating means for isolating out the set of guaranteed

transitions in said detected transitions, whereby at least one set of timing information is reconstructed; and

synchronizing means, connected to an output of said delay



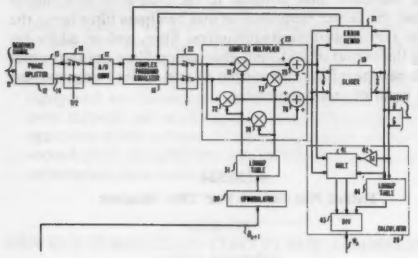
line means and said isolating means and responsive to said incoming waveform, said synchronizing means for assuring that said isolating means is properly synchronized with said incoming waveform.

4,320,526

ADAPTIVE PHASE-JITTER TRACKER

Richard D. Gitlin, Monmouth Beach, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 3, 1980, Ser. No. 126,410
Int. Cl.[3] H04B *1/10*
U.S. Cl. 375—118 7 Claims



1. A receiver for in-phase and quadrature modulated data on a carrier signal subject to phase perturbation wherein the receiver has a decision circuit (19) which provides the data output, apparatus for compensating the phase perturbation characterized in that

multiplier means, (23) immediately precedes the decision circuit, for cancelling the phase perturbation and for demodulating the carrier signal using a synthesized signal;

calculating means (26), is connected to the input and output of the decision circuit, for deriving a baseband phase error; and

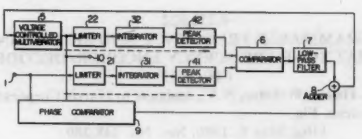
adaptive means (27, 28), is connected to receive the phase error, for producing the synthesized signal for the multiplier means, the adaptive means has a signal synthesizing section (28) having a tapped delay line (52-1 to 52-L) and a coefficient updating section (27), the coefficient updating section including a plurality of units (51-1 to 51-L) each of which is associated with a signal tap of the delay line, the signal synthesizing section including a plurality of corresponding multipliers (53-1 to 53-L) each of which provides a factor times a selected noisy estimate of the actual phase, each unit of the coefficient updating section uses an accumulation of a predetermined portion of the product of the selected noisy estimate and the phase error to control the factor of the selected noisy estimate used by the corresponding multiplier (53-1 to 53-L), means for combining (54) the outputs of the multipliers (53-1 to 53-L) of the signal synthesizing section to produce a weighted sum, and modulating means (29) for producing the synthesized signal by superimposing the weighted sum on a carrier signal component whereby the multiplier means (23) cancels out the phase perturbation and coherently demodulates the carrier signal to provide a jitter free baseband data signal for the decision circuit.

4,320,527

BIT SYNCHRONIZING SYSTEM FOR PULSE SIGNAL TRANSMISSION

Yoshitaka Takasaki, Tokorozawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 15, 1979, Ser. No. 66,643
Claims priority, application Japan, Aug. 18, 1978, 53-112456[U]; Sep. 4, 1978, 53-107501
Int. Cl.[3] H03B *3/04;* H03K *5/00*
U.S. Cl. 375—119 6 Claims



1. A bit synchronizing system for a pulse signal transmission comprising:

an input terminal to which a transmitted pulse signal is applied, said pulse signal being coded by a restricted code whose pulse repetition frequency is detectable;

a clock signal generator, the output frequency thereof being variable in response to a voltage applied thereto;

a first circuit for converting said pulse signal from the input terminal into a signal proportional to the frequency of said pulse signal from the input terminal;

a second circuit for converting the output pulse of said clock signal generator into a signal proportional to the frequency of said output pulse of said clock signal generator;

a comparing circuit for generating a signal corresponding to the difference between respective outputs of said first and second circuits;

means for controlling the frequency of said clock signal generator by means of the output of said comparing circuit; and

means for taking out the output of said clock signal generator as a timing signal.

4,320,528

ULTRASONIC CLEANER

Terry D. Scharton, Santa Monica, and G. Bruce Taylor, Culver City, both of Calif., assignors to Anco Engineers, Inc., Culver City, Calif.

Filed Jan. 23, 1980, Ser. No. 114,616
Int. Cl.[3] G21C *19/32*
U.S. Cl. 376—310 15 Claims

1. In the art of maintaining a steam generator for a nuclear power plant in which the steam generator is characterized by an enclosed tank containing a plurality of heat exchanger tubes and a plurality of support plates arranged transverse to and sequentially spaced along the longitudinal axis of the tubes and forming junctions therewith, where crevices exist between the heat exchanger tubes and the support plates at the site of the junctions, the junctions being thereby arranged in a series of groups, and also containing an outer shell and a metal wrapper inside the tank which envelops the plurality of tubes and support plates, and wherein magnetite tends to build up within the crevices at the junctions over a period of time, the process of

removing the magnetite from the crevices and the junctions while the heat exchanger tubes and support plates remain in their operative position inside the steam generator, comprising the steps of:

a. selecting a chemical solvent which when heated to a temperature between 120 degrees Fahrenheit and 220 degrees Fahrenheit dissolves magnetite exposed to fresh chemicals at a rate equal to or greater than about 1.0 inch per 24 hours;

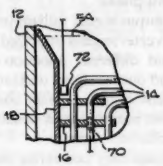
b. adding a metal corrosion inhibitor to said chemical solvent;

c. at least partially filling the tank with said chemical solvent, so as to establish an initial level which is only a few inches above the level of the uppermost group of junctions and their uppermost group of crevices;

d. selecting a plurality of sonic transducers wherein each sonic transducer has a power output greater than about 0.2 watts per square centimeter at room temperature;

e. placing said plurality of sonic transducers at a level which is below the surface of said chemical solvent, substantially in the plane of said uppermost group of junctions and uppermost group of crevices and in spaced locations around the circumference of and in contact with said metal wrapper;

f. running a hot fluid through said heat exchanger tubes so that the chemical solvent in the region adjacent said junctions and crevices reaches a temperature between 120 degrees Fahrenheit and 220 degrees Fahrenheit;



g. activating said sonic transducers to a frequency in the range of about 2 KHZ to 200 KHZ so that sonic energy is transmitted through said chemical solvent to said junctions and into and laterally of said crevices whereby cavitation induced at said junctions and at said crevices by said sonic energy cooperates with said chemical solvent so as to enhance and accelerate the removal of the magnetite from said junctions and crevices;

h. continuing the cooperative action of said hot chemical solvent and said transducers upon said uppermost group of junctions and crevices until the magnetite is removed from the junctions and crevices;

i. maintaining said chemical solvent at a temperature between 120 degrees Fahrenheit and 220 degrees Fahrenheit;

j. then lowering the level of said chemical solvent to a height which is only a few inches above the next group of junctions and crevices from which magnetite is to be removed, lowering said plurality of transducers to a corresponding lower location on said metal wrapper in a plane substantially in alignment with said next group of junctions and crevices, and again applying said cooperative effort between said hot chemical solvent and said transducers until the magnetite is removed from said next group of junctions and next group of crevices; and

k. continuing in this fashion at the level of each successive group of junctions and crevices until all of said junctions and crevices have been cleaned.

4,320,529

FREQUENCY COUNTING APPARATUS

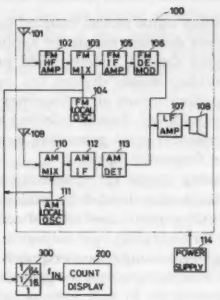
Hidetoshi Maeda; Kazuo Inoue, both of Kashiwara, and Noboru Someno, Tokyo, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka and Sony Corp., Tokyo, both of, Japan

Filed Mar. 26, 1979, Ser. No. 24,027

Claims priority, application Japan, Apr. 3, 1978, 53/39621

Int. Cl.³ G01R *23/02*

U.S. Cl. 455—158 **13 Claims**



1. An apparatus for counting the frequency of an input frequency signal, comprising:

reference oscillator means for oscillating at a frequency of 2^n Hz, where n is a positive integer,

system clock generating means operatively connected and responsive to said reference oscillator means for generating a system clock,

microprocessor means, operatively connected and responsive to said system clock generating means, said microprocessor means comprising programming means defining instructions in program steps and responsive to said system clock, wherein said system clock causes said program steps to advance, said microprocessor further comprising a central processing unit operatively connected to said programming means and counter means and responsive to said instructions in said program steps, and

gate means operatively connected and responsive to said instructions from said programming means for being controlled for a time period determined by said central processing unit, said gate means gating said input frequency signal,

said counter means in said microprocessor means counting in response to said input frequency signal gated by said gating means, and

said central processing unit being responsive to said instructions from said programming means in said microprocessor means for performing an arithmetic operation comprising the multiplication of the count value in said counter by a predetermined correction factor.

4,320,530

CHANNEL SELECTING APPARATUS EMPLOYING FREQUENCY SYNTHESIZER

Saburo Ikeda, Higashiosaka, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 9, 1979, Ser. No. 92,669

Claims priority, application Japan, Nov. 15, 1978, 53-142091

Int. Cl.³ H04B *1/16*

U.S. Cl. 455—182 **5 Claims**

4. A channel selecting apparatus employing a frequency synthesizer, comprising:

high frequency circuit means for receiving a high frequency input signal;

local oscillating means having a voltage responsive variable reactance device;

mixer means coupled to said high frequency circuit means and said local oscillator means for mixing the outputs thereof and producing an intermediate frequency signal output;

frequency dividing means for frequency dividing the local oscillation signal obtained from said local oscillating means at a given frequency division ratio;

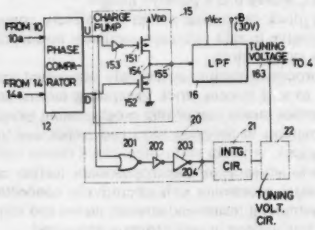
programmable frequency dividing means for frequency dividing the output signal of said frequency dividing means;

channel selecting signal means, coupled to said programmable frequency dividing means for applying a channel selecting signal thereto, wherein said programmable frequency dividing means divides the output of said frequency dividing means at a frequency division ratio in accordance with the channel selecting signal;

reference frequency signal generating means for generating a reference frequency signal;

phase comparing means for comparing the phases of the signal as frequency divided by said programmable frequency dividing means and of said reference frequency signal and for producing two outputs in response thereto;

tuning voltage generating means responsive to the output of said phase comparing means for generating a tuning voltage for application to said voltage responsive variable reactance device;



said local oscillating means being structured to stably operate over a predetermined range of said tuning voltage and said frequency dividing means being structured to stably operate over a predetermined frequency range of the input signal;

unlocked state detecting means responsive to the output of said phase comparing means for detecting deviation of at least one of said local oscillating means and said frequency dividing means from said stable operating range for detecting an unlocked state, wherein said unlocked state detecting means comprises logic circuit means for receiving the outputs of said phase comparing means and for producing a logic sum output in response thereto; and

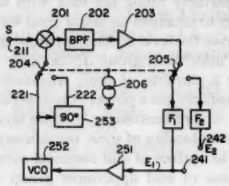
tuning voltage correcting means responsive to the output of said unlocked detecting means for correcting said tuning voltage obtained from said tuning voltage generating means for bringing at least said one of said local oscillating means and said frequency dividing means in said stable operating range wherein said tuning voltage correcting means comprises integration means for integrating the output voltage of said logic circuit means, and voltage varying means responsive to the output voltage of said integration circuit means for increasing/decreasing the tuning voltage obtained from said tuning voltage generating means.

4,320,531

TIME SHARED FREQUENCY CONVERSION SYSTEM

Donald F. Dimon, P.O. Box 15607, Fort Lauderdale, Fla. 33318

Filed Apr. 2, 1979, Ser. No. 21,941
Int. Cl.³ H04B 1/26
U.S. Cl. 455—203 **5 Claims**



1. A frequency conversion system, comprising:

at least one source of data signals;

a plurality of sources of injection oscillation signals differing from each other with respect to one of the parameters of frequency and phase;

a plurality of output signal utilization means; and

frequency converter means supplied with said data signals and with said different injection oscillation signals for supplying said output signal utilization means with respectively different output signals corresponding to respectively different combinations of said data signals with said injection oscillation signals;

wherein said frequency converter means comprises a nonlinear signal combiner having at least one data signal input terminal, a plurality of injection-oscillation signal input terminals and an output terminal; and

time-multiplexing means for establishing successive different combinations of connections of said terminals of said signal combiner to said at least one source of data signals, to said plurality of injection-oscillation signal terminals and to said plurality of output signal utilization means to produce said respectively different output signals in sampled form;

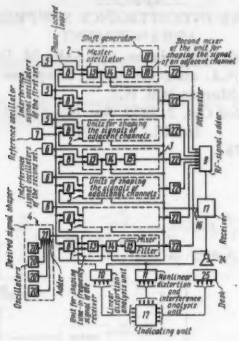
said time-multiplexing means switching among said different combinations at a rate at least as great as twice the highest frequency present in said data signals, and said plurality of output signal utilization means each comprising filter means for smoothing said output signals of sampled form to produce corresponding respective continuous output signals;

wherein said at least one source of data signals comprises a first source to first data signals, said plurality of sources of first oscillator injection signals comprises a first source of first oscillator injection signals and a second source of second oscillator injection signals, said plurality of output signal utilization means comprises first and second output signal utilization means having first and second filter means respectively, said first and second oscillator injection signals differ from each other in phase but are the same in frequency, and said different combination comprise a first combination of said first data signals with said first oscillator injection signals and a second combination of said first data signals with said second oscillator injection signals.

4,320,532
APPARATUS FOR AUTOMATIC MONITORING OF SUPERHETERODYNE RADIO RECEIVERS

Mikhail U. Bank, ulitsa Sofiiskaya, 40, korpus 1, kv. 128, Leningrad; Valery I. Prozorov, ulitsa Sovetskaya, 94, kv. 21, Sarapul; Nikolai A. Rubichev, p.o. Mendeleeva; ulitsa Pionerskaya, 2, kv. 50, Moskovskaya oblast, Mikhail V. Odnolko, ulitsa Podvoiskogo, 14, korpus 1, kv. 848; Evgeny A. Rozenberg, ulitsa Partizana Germana, 10, korpus 3, kv. 66, both of Leningrad; Alexei F. Bessonov, ulitsa Njutona, 133, kv. 225, Kharkov; Iraida K. Berezjuk, ulitsa Savushkina, 12, kv. 41, and Sergei D. Guzikov, Serebristy bulvar, 15, kv. 325, both of Leningrad, all of U.S.S.R.

Filed Jul. 7, 1980, Ser. No. 166,456
Claims priority, application U.S.S.R., Dec. 7, 1979, 2780601
Int. Cl.³ H04B *17/00*
U.S. Cl. 455—226 **5 Claims**



1. An apparatus for automatic monitoring of superheterodyne radio receivers having an input, an output, and a heterodyne output, comprising:

a unit for shaping the tune-in frequency signal of the receiver, including,

a master oscillator having a synchronizing input,

a modulation input and an output;

a mixer having a first input connected to said output of said master oscillator, a second input connected to said heterodyne output of the receiver to be tested, and an output; and

a filter having an input connected to said output of said mixer, and an output;

a plurality of units for shaping the signals of adjacent channels each of which includes:

a master oscillator having a synchronizing input, a modulation input, and an output;

a first mixer having a first input connected to said output of said master oscillator of this unit, a second input connected to said heterodyne output of the receiver to be tested, and an output;

a filter having an input connected to said output of said first mixer, and an output;

a shift generator adapted for generating a voltage at a frequency equal to the difference between the tune-in frequency of the receiver and the signal frequency of a particulator adjacent channel, and having an output; and

a second mixer having a first input connected to said output of said filter of this unit, a second input connected to said output of said shift generator, and an output;

a plurality of units for shaping the signals of additional channels including each:

a master oscillator having a synchronizing input, a modulation input, and an output;

a mixer having a first input connected to said output of said master oscillator of this unit, a second input connected to said heterodyne output of the receiver to be tested, and an output; and

a filter having an input connected to said output of said mixer of this unit, and an output;

a desired signal shaper having an output connected to said modulation input of said master oscillator of said unit for shaping the tine-in frequency signal of the receiver;

a first set of interference signal oscillators, their number being equal to the number of said units for shaping the sigals of adjacent channels, each of said interference signal oscillators of the first set having an output connected to said modulation input of said master oscillator of one of said units for shaping the signals of adjacent channels;

a second set of interference signal oscillators, their number being equal to the number of said units for shaping the signals of additional channels, each of said interference signal oscillators of the second set having an output; connected to a respective one of said units for shaping the signals of additional channels

a reference oscillator having an output;

a plurality of phase-locked loops, their number being equal to the number of all said signal-shaping units, each of said phase-locked loops having a first input connected to said output of said reference oscillator, a second input connected to said output of said master oscillator of one of said signal-shaping units, and an output connected to said synchronizing input of said master oscillator of this signal-shaping unit;

an adder of r.f. signals having a plurality of inputs with their number equal to the number of all signal-shaping units, said inputs of said adder being connected to said output of said filter of said unit for shaping the tune-in frequency signal of the receiver, to said outputs of said filters of said units for shaping the signals of additional channels, and to said outputs of said second mixers of said units for shaping the signals of adjacent channels respectively; and having an output connected to said input of said receiver

a linear distortion analysis unit having an input connected to said output of the receiver to be tested, and at least one output;

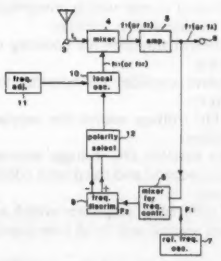
a nonlinear distortion and interference analysis unit having an input connected to said output of the receiver to be tested, and at least one output; and

an indicating unit connected to said outputs of said linear distortion analysis unit and said nonlinear distortion and interference analysis unit.

4,320,533
FREQUENCY STABILIZED DOWNCONVERTER FACILITATING OUTPUT FREQUENCY ALTERATION

Akio Hashima, c/o Matsushita Electric Industrial Co., Ltd., 1006 Kadoma, Osaka, Japan

Filed Sep. 24, 1979, Ser. No. 78,283
Claims priority, application Japan, Sep. 28, 1978, 53-120052
Int. Cl.³ H04B *1/16*; H04N *5/44*
U.S. Cl. 455—259 **1 Claim**



1. A downconverter comprising:

a local oscillator whose frequency is controlled by a DC voltage and including a frequency adjusting means for varying an output signal frequency of said downconverter;

a mixer for converting an input signal to an intermediate frequency output signal with the signal obtained from the output of said local oscillator;

means for obtaining a difference frequency signal between a reference signal and said output signal whose frequency may be varied;

a frequency discriminator having a fixed center frequency and producing a DC control voltage proportional to a drift of said difference frequency;

a reference frequency signal oscillator for producing said reference signal whose frequency is chosen such that said difference frequency corresponds to said fixed center frequency of said discriminator when said output signal frequency is varied; and

means for supplying said DC control voltage to said local oscillator so as to compensate for a frequency drift in said local oscillator;

wherein the frequency of said output signal is set at one of two frequencies f_1 and f_2 by varying said local oscillator frequency, where each of said frequencies f_1 and f_2 is a video carrier frequency of television signals, and $f_2 > f_1$; said reference frequency signal oscillator operates at a frequency $F_1=(f_1+f_2/2)$, and said center frequency of said frequency discriminator is $f_d=(f_2-f_1/2)$; and the output polarity of said frequency discriminator is selected so as to compensate for a frequency drift in said local oscillator in relation to said output signal frequency of frequency $f_1$or f_2.

4,320,534

LOUDNESS CONTROL CIRCUIT

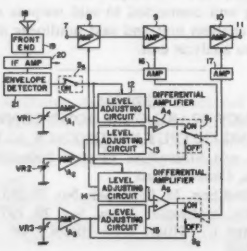
Koichi Sakai, and Satoru Horie, both of Tokyo, Japan, assignors to Toko Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1980, Ser. No. 200,064

Claims priority, application Japan, Oct. 25, 1979, 54-138135; Nov. 22, 1979, 54-161878[U]

Int. Cl.³ H03G *5/14*; H04B *1/16*

U.S. Cl. 455—267 **3 Claims**



1. A loudness control circuit which comprises:

a first amplifier for increasing volume;

a second tone control amplifier for boosting tones in a low frequency range;

a third tone control amplifier for boosting tones in a high frequency range;

a first variable DC voltage source for varying the gain of said first amplifier;

second and third variable DC voltage sources for varying the gains of said second and third tone control amplifiers, respectively; and

first and second differential amplifiers which are operatively coupled to said second and third tone control amplifiers, respectively,

an output DC voltage of said first variable DC voltage source being applied to said first amplifier to vary the gain of said first amplifier, and to said first and second differential amplifiers, and output DC voltages of said second and third variable DC sources being applied to said first and second differential amplifiers to provide difference voltages, which are applied to said second and third tone control amplifiers to control the gains of said second and third tone control amplifiers, so that the tone in the low and high frequency ranges are boosted, thereby to achieve weighting.

4,320,535

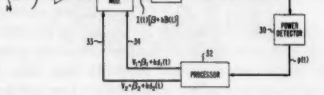
ADAPTIVE INTERFERENCE SUPPRESSION ARRANGEMENT

Douglas M. Brady, Fair Haven, and Anita M. Gupta, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 3, 1979, Ser. No. 81,552

Int. Cl.³ H04B *1/10*

U.S. Cl. 455—278 **3 Claims**



1. An adaptive interference suppression arrangement comprising:

a primary antenna (**10**) capable of receiving a signal which may include a first desired signal (**12**) and a second interfering signal (**14**);

an auxiliary antenna (**20**) capable of receiving a signal including primarily the second interfering signal;

means (**24**) capable of deriving quadrature components of the signal received at the auxiliary antenna and adjusting the amplitude and phase of said quadrature components in response to control signals for generating an estimated interference cancellation signal;

combining means (**18**) capable of combining the output signals from the primary antenna and the estimated interference cancellation signal from the deriving and adjusting means for substantially cancelling the second interfering signal at the output thereof; and

a correlator (**30, 32**) capable of generating the appropriate control signals to the deriving and adjusting means to cause substantial cancellation of the second interfering signal at the output of the combining means

characterized in that

the correlator comprises:

a power detector (**30**) capable of generating an output signal representative of the power envelope of the output signal of the combining means; and

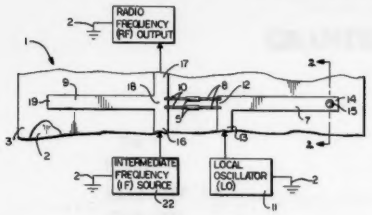
a processor (**32**) capable of generating the appropriate control signals in response to the output signal from said power detector for transmission to the deriving and adjusting means for appropriately adjusting the phase and amplitude of the second interfering signal quadrature components to achieve maximum cancellation of the second interfering signal at the output of the combining means.

4,320,536

SUBHARMONIC PUMPED MIXER CIRCUIT

James L. Dietrich, 1642 Baltimore, Derby, Kans. 67037

Filed Sep. 18, 1979, Ser. No. 76,762
Int. Cl.[3] H04B 1/26
U.S. Cl. 455—325 8 Claims



1. An unbalanced subharmonic pumped mixer circuit comprising:

(a) an antiparallel connected diode pair functioning as a semiconductor switch;

(b) a radio frequency (RF) port, an intermediate frequency (IF) port, and a local oscillator (LO) port;

(c) RF, IF, and LO input coupling means connected respectively to said ports for signals thereat; and

(d) an embedding circuit interconnecting said RF, IF, and LO coupling means with said diode pair for the separation of RF, IF, and LO signals and for the mutual isolation of said RF and LO ports, said embedding circuit including two transverse electromagnetic (TEM) transmission lines operatively connected to said diode pair, each of said lines being substantially one quarter wavelength at a local oscillator frequency f_{LO};

(e) a first of said transmission lines having one end operatively connected to said RF port and an opposite end open circuited to provide at said RF port a short circuit at the local oscillator frequency f_{LO} and odd harmonics thereof and an open circuit at even harmonics thereof to thereby isolate said RF port from signals at f_{LO} odd harmonics thereof; and

(f) a second of said transmission lines having one end operatively connected to said LO port and an opposite end short circuited to provide at said LO port an open circuit at f_{LO} and odd harmonics thereof and a short circuit at even harmonics thereof to thereby isolate said LO Port from signals at even harmonics of f_{LO}.

DESIGN PATENTS

GRANTED MAR. 16, 1982

ERRATA

For CLASS	See PATENT NO.
D32–048	263,364
D34–001	263,365
D34–043	263,375
D34–021	263,388
D34–038	263,389
D34–038	263,390
D21–051	263,429

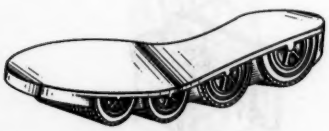
DESIGNS

MARCH 16, 1982

263,345
LOUNGING GOWN OR THE LIKE
Elza C. Phelps, 5220 Woodland Ave., Philadelphia, Pa. 19143
Filed Aug. 23, 1979, Ser. No. 64,559
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—82

263,346
SKATE COVER
Cindy Silverman, Carlton House 2-A, Millville, N.J. 08332
Filed Jan. 11, 1980, Ser. No. 111,221
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—272

263,347
CHILDREN'S SHOE SOLE
Ralph Shanks, and Ralph Shanks, Jr., both of 4448 Sigma Rd., Suite 101, Dallas, Tex. 75240
Filed Jan. 15, 1979, Ser. No. 3,550
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—321

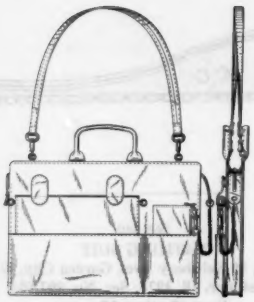


263,348
SOLE FOR FOOTWEAR
Jacques Cohen, 1370 Avenue of the Americas, New York, N.Y. 10019
Filed Dec. 20, 1978, Ser. No. 971,545
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—322

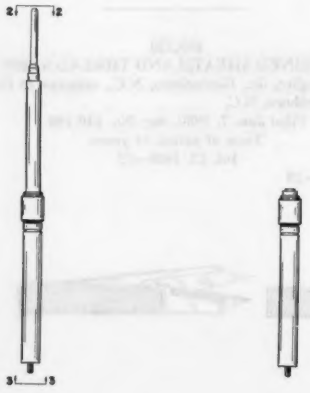
263,349
BATHING SUIT
Henry G. Dietz, 80 Salisbury Ave., Garden City, N.Y. 11530
Filed Apr. 18, 1978, Ser. No. 897,653
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—41

263,350
COMBINED SHEATH AND THREAD SNIPS
Clair H. Gingher, Jr., Greensboro, N.C., assignor to Gingher, Inc., Greensboro, N.C.
Filed Jan. 7, 1980, Ser. No. 110,198
Term of patent 14 years
Int. Cl. D08—*03*
U.S. Cl. D3—18

263,351
COMBINED ATTACHE CASE, HANDBAG AND POUCH
Rosemarie Monaco, 59-30 108th St., Corona, N.Y. 11368
Filed Jun. 21, 1979, Ser. No. 50,293
Term of patent 7 years
Int. Cl. D3—*01*
U.S. Cl. D3—43

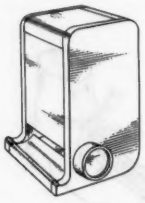


263,352
MUSICAL INSTRUMENT STAND
Alan G. Siegel, 7811 N. Fairchild Rd., Milwaukee, Wis. 53217
Filed Apr. 6, 1979, Ser. No. 27,862
Term of patent 14 years
Int. Cl. D06—*99*
U.S. Cl. D6—20

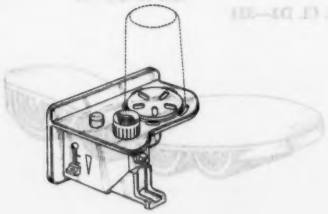


263,353
BENCH
Matthew E. Beals, St. Louis, Mo., assignor to Falcon Products Incorporated, St. Louis, Mo.
Filed Jan. 14, 1980, Ser. No. 111,968
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—60

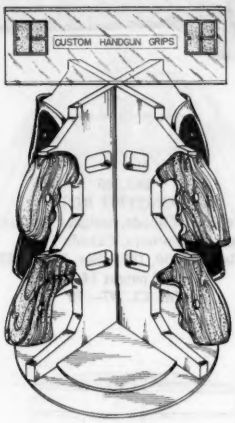
263,354
TAMPON DISPENSER
Linda M. Jones, 1508 Stanford Way, Sparks, Nev. 89431
Filed Feb. 29, 1980, Ser. No. 125,901
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—86



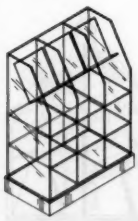
263,355
COMBINED TOOTHPASTE DISPENSER, TOOTHBRUSH AND TUMBLER HOLDER
Masahiro Iwamoto, 358, Hiraoka-cho, Sakai-shi, Osaka-fu, Japan
Filed Mar. 31, 1980, Ser. No. 136,454
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—87



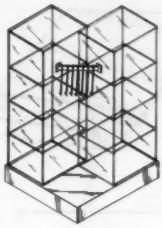
263,356
DISPLAY UNIT FOR HAND GUN GRIPS
George L. Myer, Dauphin, Pa., assignor to Kassnar Imports, Harrisburg, Pa.
Filed Feb. 12, 1979, Ser. No. 11,368
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—151



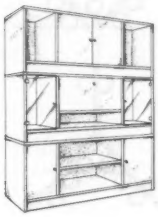
263,357
SHIRT BIN DISPLAY UNIT
Nedim Savas, Wheaton, Md., assignor to Russell William Ltd., Columbia, Md.
Filed Apr. 2, 1980, Ser. No. 136,468
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—186



263,358
BEACH TOWEL DISPLAY UNIT
Russell K. Winter, Crownsville; Nedim Savas, Wheaton; Joseph H. Snively, Bethesda, and Thomas D. Harvey, Silver Spring, all of Md., assignors to Russell William Ltd., Columbia, Md.
Filed Apr. 3, 1980, Ser. No. 136,795
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—186

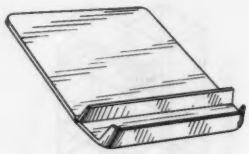


263,359
COMBINED STACKABLE CABINET AND SHELF UNIT OR THE LIKE
Alonzo Parrish, III, Rte. 1, Stedman, N.C. 28391
Filed Apr. 17, 1979, Ser. No. 31,195
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—169

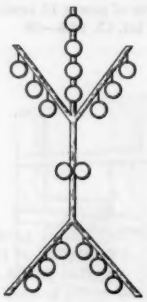


263,360
STORAGE SHELTER
Joseph W. Sroub, Parma, Ohio, assignor to Cardinal American Corporation, Cleveland, Ohio
Filed Jan. 21, 1980, Ser. No. 113,512
Term of patent 14 years
Int. Cl. D6—*04*; D7—*08*; D25—*03*
U.S. Cl. D6—179

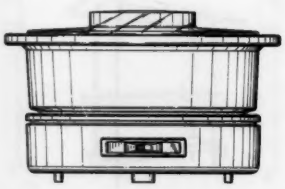
263,361
MUSIC STAND TOP OR SIMILAR ARTICLE
Logan W. Johnson, Edina; Jerry A. Wenger, and Wayne V. Tenner, both of Owatonna, all of Minn., assignors to Wenger Corporation, Owatonna, Minn.
Filed Dec. 10, 1979, Ser. No. 102,824
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



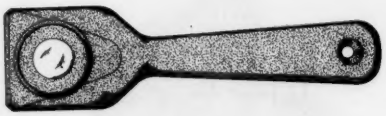
263,362
PHOTOGRAPH DISPLAY TREE
Willie M. Jackson, 7705 S. Carpenter, Chicago, Ill. 60620
Filed Dec. 26, 1979, Ser. No. 106,948
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234



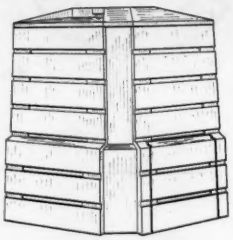
263,363
ELECTRIC COOKING AND SERVING VESSEL
James T. Williams, Jackson County, Mo., and Joseph A. Rinaldi, Bergen County, N.J., assignors to Rival Manufacturing Company, Kansas City, Mo.
Filed May 8, 1979, Ser. No. 37,222
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—94



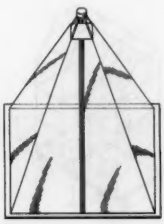
263,364
PAINT SCRAPER HANDLE
Robert H. Bruno, Avon, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Aug. 29, 1979, Ser. No. 70,857
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—48



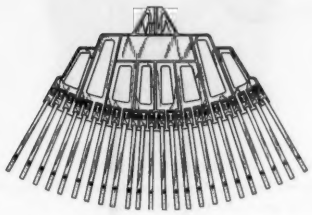
263,365
COMPOST BIN
Paul T. Arato, Toronto, Canada, assignor to Barclay Rothschild Manufacturing Ltd., Toronto, Canada
Filed Jan. 30, 1979, Ser. No. 7,833
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D34—1



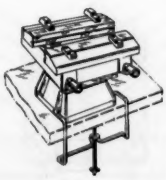
263,366
PLANT GROWTH ENHANCEMENT ENCLOSURE
John R. Strenger, 5 June Ter., and Steven D. Blanchard, 335 E. Scott St., both of Lake Forest, Ill. 60045
Filed Aug. 9, 1979, Ser. No. 65,353
Term of patent 14 years
Int. Cl. D99—*00*; D11—*02*
U.S. Cl. D8—1



263,367
LEAF RAKE HEAD
William G. Fodor, Blairs, Va., and James E. Edgell, Senatobia, Miss., assignors to Sandvik, Inc., Greensboro, N.C.
Filed Aug. 29, 1979, Ser. No. 70,679
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—13



263,368
VISE WITH SWIVEL BASE
Robert P. Wagster, Greensboro, and Roderick F. Bunyea, Cockeysville, both of Md., assignors to Black & Decker Inc., Newark, Del.
Filed Nov. 19, 1979, Ser. No. 95,739
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—74



263,369
PICKAXE WITH A SAW INSIDE
Chin-Tui Kuo, No. 1-10, Ta Ho I Hsiang, Hsi Tun District, Taichung, Taiwan
Filed Dec. 26, 1979, Ser. No. 107,391
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—81

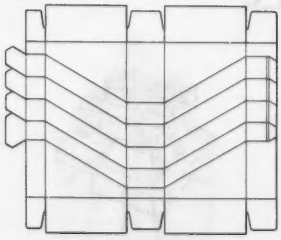
263,370
HINGE PIN
Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.
Filed Jan. 14, 1980, Ser. No. 111,881
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—323

263,371
DESIGN FOR AN ELECTRIC CORD REEL
John E. Allen, 706 Apollo Dr., Denton, Tex. 76201
Filed Dec. 11, 1979, Ser. No. 102,354
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—358

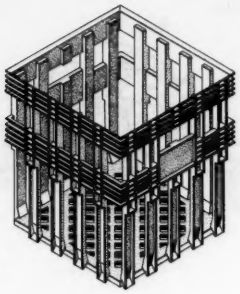
263,372
BOTTLE OR SIMILAR ARTICLE
Serge Mansau, Neuilly-sur-Seine, France, assignor to Lever Brothers Company, New York, N.Y.
Filed Jan. 28, 1980, Ser. No. 116,078
Claims priority, application United Kingdom, Aug. 28, 1979, 991331/79
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—400

263,373
BOTTLE OR SIMILAR ARTICLE
John R. Howard, West Chicago; Robert W. Machacek, Lombard, both of Ill., and John W. Fine, Jr., Independence, Mo., assignors to Ethyl Development Corporation, Baton Rouge, La.
Filed Aug. 20, 1979, Ser. No. 67,732
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—403

263,374
BLANK FOR A TEAR STRIP PACKAGING CONTAINER
William D. Kinsell, Jr., Westlake, Ohio, assignor to SCM (Canada) Limited, Don Mills, Canada
Filed Feb. 8, 1979, Ser. No. 10,379
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433



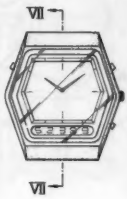
263,375
CRATE
Paul G. Thurman, West Liberty, Ohio, assignor to Dare Pafco, Inc., Urbana, Ohio
Filed Sep. 10, 1979, Ser. No. 74,107
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D34—43



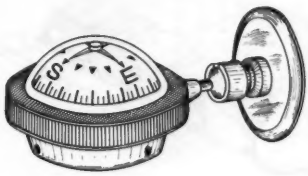
263,376
COMBINED WRISTWATCH AND CALCULATOR
Hiroshi Saito, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Feb. 27, 1980, Ser. No. 125,074
Claims priority, application Japan, Sep. 18, 1979, 54-39196
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—31

263,377
WRIST WATCH
Gianni Bvlgari, Rome, Italy, assignor to Anthos, S.A., Geneva, Switzerland
Filed Jun. 1, 1979, Ser. No. 44,382
Claims priority, application Hague, Dec. 1, 1978, 67945
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

263,378
WRIST WATCH
Yutaka Fukumura, Higashi Murayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Jun. 8, 1979, Ser. No. 46,788
Claims priority, application Japan, Feb. 17, 1979, 54-5853; Dec. 21, 1978, 53-54081
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

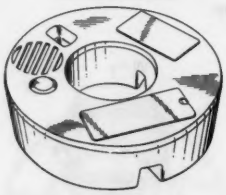


263,379
MAGNETIC COMPASS
Hiroo Uchiyama, Nakajuku, Itabashi-ku, Tokyo, Japan
Filed Jul. 20, 1979, Ser. No. 59,160
Claims priority, application Japan, Jan. 29, 1979, 54-2891
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—68

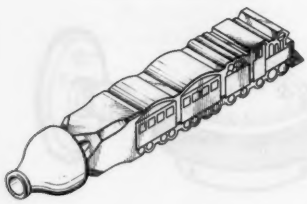


263,380
MICROWAVE DETECTOR
Lorne E. Hay, 7070 Barkley Dr., Delta, British Columbia, Canada
Filed Dec. 31, 1979, Ser. No. 108,728
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78

263,381
MOISTURE ALARM HOUSING
Jerry K. Kelley, 3121 N. Nottingham, Chicago, Ill. 60634
Filed Dec. 26, 1979, Ser. No. 106,389
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



263,382
TOY TRAIN WHISTLE
Arnold P. Moore, 601 S. First St., Benton, Ill. 62812
Filed Oct. 26, 1979, Ser. No. 88,661
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—119

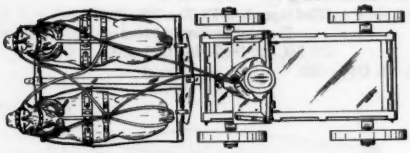


263,383
TOY TRAIN WHISTLE
Arnold P. Moore, 601 S. First St., Benton, Ill. 62812
Filed Oct. 30, 1979, Ser. No. 89,668
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—119

263,384
ZODIACAL CUSP MEDALLIONS
Patricia A. Martignette, 212 Cottage Blvd., Hicksville, N.Y. 11801
Filed Jul. 17, 1979, Ser. No. 58,730
Term of patent 14 years
Int. Cl. D11—*03*
U.S. Cl. D11—100

263,385
SCULPTURE OR SIMILAR ARTICLE
George W. Walker, Chesterfield, N.J., assignor to Custom Decor, Inc., Dover, Del.
Filed Jan. 3, 1980, Ser. No. 109,409
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

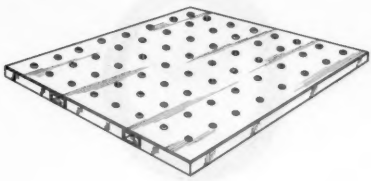
263,386
LAWN ORNAMENT
Thomas L. Laurent, P.O. Box 136, Coffeen, Ill. 62017
Continuation-in-part of Ser. No. 730,796, Oct. 8, 1976, abandoned. This application Mar. 13, 1979, Ser. No. 20,236
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—159



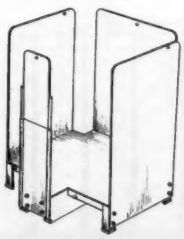
263,387
WEDDING FAVOR
Joan B. Shahan, 3100 Laredo Dr., Fort Worth, Tex. 76116
Filed Jul. 18, 1979, Ser. No. 58,737
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—162

263,388
MOBILE RACK FOR VERTICALLY SUPPORTING ROLLS OF PAPER
Donald W. Lash, deceased, late of Kentwood, Mich., and by Gertrude Lash, executrix, 1485 Langley, S.W., Grand Rapids, Mich. 49506, assignors to Gertrude Lash, Grand Rapids, Mich.
Filed May 30, 1978, Ser. No. 910,744
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—21

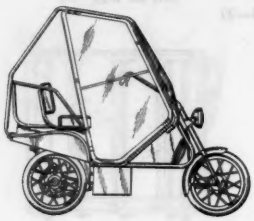
263,389
PALLET
Claes Nordström, Sigvard Grubbesgatan 12, S-230 40 Bara, Sweden
Filed Jan. 15, 1980, Ser. No. 112,181
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D34—38



263,390
MATERIAL STACKING BIN FOR USE WITH A PALLET
Ian M. Lasscock, P.O. Box 42, Lockleys, Australia (5032)
Filed Feb. 22, 1980, Ser. No. 123,912
Claims priority, application Australia, Nov. 5, 1979, 79463
Term of patent 14 years
Int. Cl. D9—*08*
U.S. Cl. D34—38

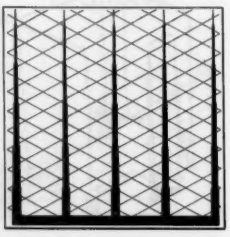


263,391
THREE-WHEELED MOTOR VEHICLE
Stuart Pivar, New York, N.Y., assignor to American Microcar, Inc., Farmingdale, N.Y.
Filed Jan. 7, 1980, Ser. No. 110,089
Term of patent 14 years
Int. Cl. D12—*08, 11*
U.S. Cl. D12—85

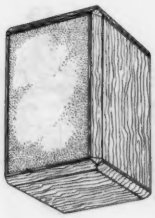


263,392
TIRE
Roger Van de Walker, El Toro, Calif., assignor to Zeus Manufacturing, Inc., Costa Mesa, Calif.
Filed Feb. 4, 1980, Ser. No. 118,391
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—139

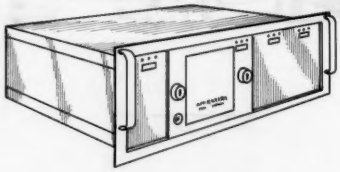
263,393
SOLAR CELL
Joseph Lindmayer, Bethesda, Md., assignor to Solarex Corporation, Rockville, Md.
Filed Jan. 18, 1978, Ser. No. 870,503
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—4



263,394
LOUDSPEAKER ENCLOSURE
John Szabo, Cambridge, Canada, assignor to Szabo Audio Systems Limited, Cambridge, Canada
Filed Oct. 23, 1979, Ser. No. 87,817
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33

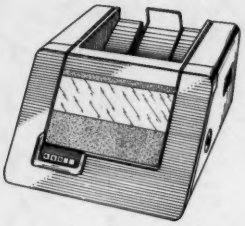


263,395
MULTIPLE MODULE SERIAL LINK ENCRYPTION UNIT OR SIMILAR ARTICLE
Joseph W. Karas; Robert F. Pfeifer, both of Phoenix, and Robert Samson, Scottsdale, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.
Filed Apr. 2, 1979, Ser. No. 25,956
Term of patent 14 years
Int. Cl. D14—*02;* D13—*03*
U.S. Cl. D14—100

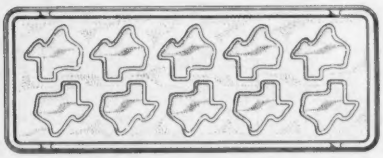


263,396
DESK TYPE BUSINESS COMPUTER
Shuzo Horikoshi, Kawanishi; Ken Kawamura, Ibaragi, and Shoichi Kobayashi, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 24, 1979, Ser. No. 88,214
Claims priority, application Japan, Apr. 24, 1979, 54-16992
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—105

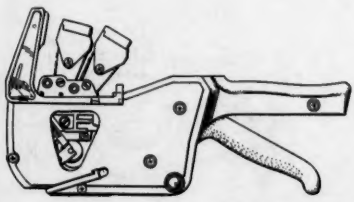
263,397
COMPUTER-DRIVEN PRINTER
Albert E. Vierling; Harry C. Nicholson, and Earl J. Huddleston, all of Cincinnati, Ohio, assignors to ReyZon Computers, Cincinnati, Ohio
Filed Aug. 8, 1979, Ser. No. 64,837
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—111



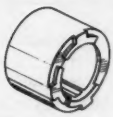
263,398
ICE TRAY
Billy J. Tiller, San Antonio, Tex., assignor to Great State Productions, Inc., San Antonio, Tex.
Filed Jan. 30, 1980, Ser. No. 117,023
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—90



263,399
HAND OPERATED TAG PRINTING MACHINE
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan
Filed Jan. 31, 1980, Ser. No. 117,268
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D18—19

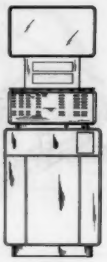


263,400
CORE FOR ELONGATED STRIP
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan
Continuation-in-part of Ser. No. 715,250, Aug. 17, 1976. Des. Pat. No. 252,755, which is a continuation-in-part of Ser. No. 646,510, Jan. 5, 1976, abandoned. This application Apr. 24, 1979, Ser. No. 32,917
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—67

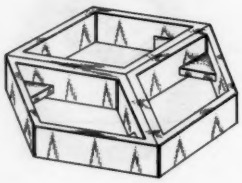


263,401
DUMP TRUCK TOY WITH ENCLOSURE
Alan A. Hicks, Chicago; Harry Disko, South Barrington, both of Ill., and Robert K. Allen, Cincinnati, Ohio, assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Feb. 8, 1980, Ser. No. 119,741
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—12

263,402
ONE PLAYER VIDEO GAMBLING MACHINE
James H. Muir, Indialantic, Fla., assignor to Video Turf Incorporated, New York, N.Y.
Filed Feb. 22, 1980, Ser. No. 123,675
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



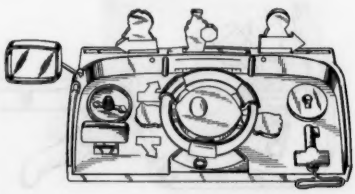
263,403
GAME MARKER
Yi Chen, 23356 Batey Ave., Harbor City, Calif. 90710
Filed Jan. 21, 1980, Ser. No. 113,518
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—51



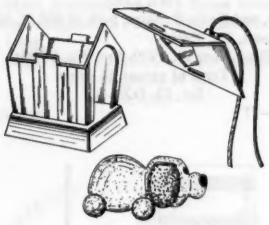
263,404
OWL RATTLE
Robin Clark, Kenley, England, assignor to Hilary Page "Sensible" Toys Limited, Kenley, England
Filed Sep. 5, 1979, Ser. No. 72,606
Claims priority, application United Kingdom, Mar. 16, 1979, 989080/79
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—65

263,405
COMBINED GRASPING AND HANDLING TOY RATTLE OR SIMILAR ARTICLE
Richard A. Chase, Baltimore, Md.; D. Michael Williams, Montreal, Canada, and Danny E. Simpson, Baltimore, Md., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.
Filed Dec. 18, 1979, Ser. No. 104,997
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—65

263,406
SIMULATIVE DRIVING TOY
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed Sep. 10, 1979, Ser. No. 73,681
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—142

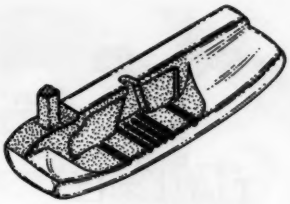


263,407
TOY DOG IN DOG HOUSE
Ira Gilford, Ridgewood, N.J., assignor to Lawrence L. Reiner, Woodbury, N.Y.
Filed Feb. 27, 1980, Ser. No. 125,045
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—161

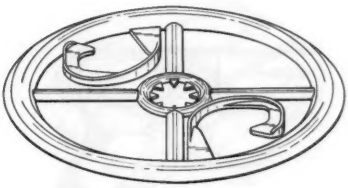


263,408
WAIST-MOUNTED BALL PADDLE
William J. McMeley, 2502 Canyon Creek Dr., Sherman, Tex. 75090
Filed Feb. 21, 1979, Ser. No. 13,669
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—213

263,409
GOLF PUTTER HEAD
Clovis R. Duclos, 6327 Marina Pasifica Dr., Long Beach, Calif. 90803
Filed Sep. 24, 1979, Ser. No. 78,821
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—219



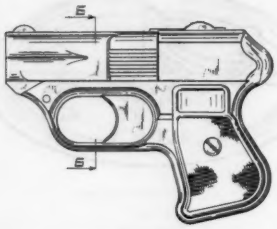
263,410
RING FOR SKI POLE
Arve Wien, Fabrikkveien 5, NO-2380 Brumunddal, Norway
Filed May 14, 1979, Ser. No. 38,626
Claims priority, application Norway, Nov. 7, 1978, 59647
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—230



263,411
BILLIARD BALL GAME TARGET
Stanley F. Davis, Auckland, New Zealand, assignor to Vitelle Holdings Limited, Auckland, New Zealand
Filed Jul. 17, 1979, Ser. No. 58,290
Claims priority, application New Zealand, Apr. 12, 1979, 190178
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—232

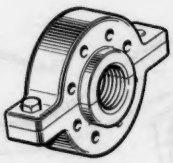
263,412
PLAYGROUND SEATING UNIT
Donald S. Ament, Encino, and Duane S. Ament, Hollywood, both of Calif., assignors to Miracle Recreation Equipment Company, Grinnell, Iowa
Filed Sep. 20, 1979, Ser. No. 77,367
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—242

263,413
HANDGUN
Robert Hillberg, Cheshire, Conn., assignor to COP, Inc., Torrance, Calif.
Filed Jan. 14, 1980, Ser. No. 111,584
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—1

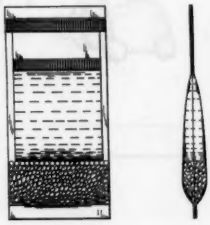


263,414
DEODORIZER
John E. Dolan, Old Orchard St., Harrison, N.Y. 10528
Filed May 7, 1979, Ser. No. 36,321
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

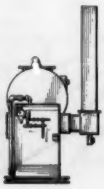
263,415
PIPE COUPLING ADAPTER FLANGE
Charles W. Roche, Shrewsbury, Mass., assignor to Uni-Flange Corporation, Northboro, Mass.
Filed Nov. 26, 1979, Ser. No. 97,353
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43



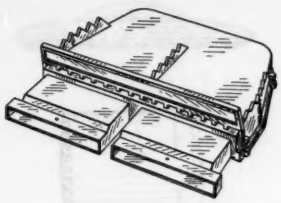
263,416
SELF-CONTAINED CHEMICAL HAND WARMER OR THE LIKE
Keith G. Saire, and Kevin P. Saire, both of 404 N. Monongahela Ave., Glassport, Pa. 15045
Filed Nov. 28, 1979, Ser. No. 97,926
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—77



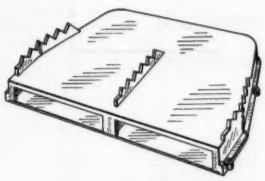
263,417
SELF-CONTAINED SOLID FUEL BOILER SYSTEM
Frederick J. Keller, Long Lake, and Walter G. Horton, Isanti, both of Minn., assignors to Energy Resource Systems, Inc., Minneapolis, Minn.
Filed Nov. 26, 1979, Ser. No. 97,306
Term of patent 14 years
Int. Cl. D23—*05*
U.S. Cl. D23—86



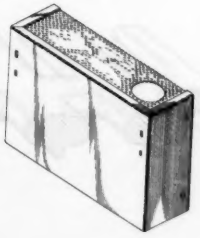
263,418
LOW PROFILE FIREPLACE HEAT EXCHANGER
Thomas V. Metz, Portland, and W. James Sirois, Beaverton, both of Oreg., assignors to Pacific Fireplace Furnishings, Inc., Portland, Oreg.
Filed Mar. 26, 1979, Ser. No. 23,905
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—95



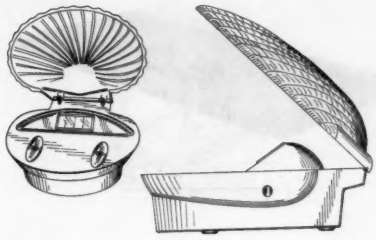
263,419
CASTING FOR LOW PROFILE FIREPLACE HEAT EXCHANGER
Thomas V. Metz, Portland, and W. James Sirois, Beaverton, both of Oreg., assignors to Pacific Fireplace Furnishings, Inc., Portland, Oreg.
Filed Mar. 26, 1979, Ser. No. 23,610
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—95



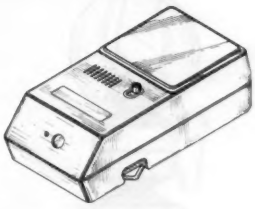
263,420
COMBINED STOVE DOOR SUPPORTED THERMOSTAT AND DAMPER SHIELDING HOUSING WITH ACCESS SHIELDING LOWER BARRIER
William H. Johnson, Harrisonburg, Va., assignor to Shenandoah Manufacturing Co., Inc., Harrisonburg, Va.
Filed Jul. 13, 1979, Ser. No. 57,331
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—137



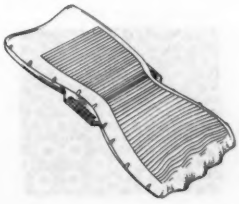
263,421
OVULOMETER
Channing W. Gilson, Los Angeles, Calif., assignor to Ovutron Corp., Las Vegas, Nev.
Filed Feb. 12, 1979, Ser. No. 11,491
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17



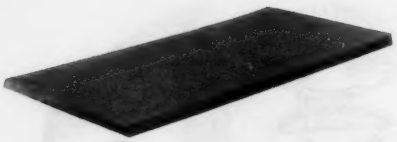
263,422
SPHYGMOMANOMETER OR SIMILAR ARTICLE
Shinji Koshino, Shibukawa, Japan, assignor to Nihon Seimitsu Sokki Co., Ltd., Gunma, Japan
Filed Mar. 2, 1979, Ser. No. 16,982
Claims priority, application Japan, Sep. 2, 1978, 53-37169
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—21



263,423
ARM SUPPORT DEVICE FOR INTRAVENOUS FEEDING
Jerry L. Aslanian, Phoenix, Ariz., assignor to Master Medical Corp., Phoenix, Ariz.
Filed May 18, 1979, Ser. No. 40,316
Term of patent 14 years
Int. Cl. D24—*04, 99*
U.S. Cl. D24—64

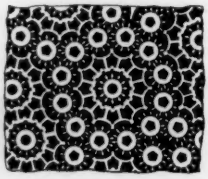


263,424
ACOUSTICAL CEILING PANEL
Mark R. Weitzman, Toledo, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Sep. 27, 1979, Ser. No. 79,395
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—97



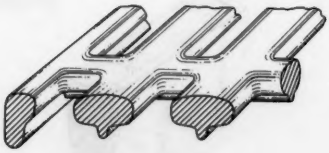
263,425
DECORATIVE OIL LAMP
Victor R. Despard, III, Lancaster, Pa., assignor to Kaadan, Limited, Lancaster, Pa.
Filed Mar. 30, 1979, Ser. No. 25,407
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—105

263,426
LIGHT TRANSMITTING PANEL
Frank A. Sportelli, 7 Redwood Ct., Glen Cove, N.Y. 11542
Filed Jul. 30, 1979, Ser. No. 61,960
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—120



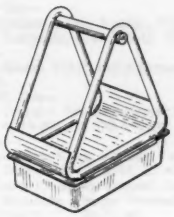
263,427
HAIRDRYER
Roderick McBrien, Poole, England, assignor to Firth Cleveland Limited, London, England
Filed Oct. 30, 1979, Ser. No. 89,484
Claims priority, application United Kingdom, Jul. 20, 1979, 990840/79
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

263,428
FLOOR PANEL FOR A PIG SHED
Franz Bartscher, Geseke, Fed. Rep. of Germany, assignor to Josef Schonlau, Maschinenfabrik-und Eisengiesserei, Fed. Rep. of Germany
Filed Nov. 1, 1979, Ser. No. 90,098
Term of patent 14 years
Int. Cl. D30—*2*
U.S. Cl. D30—2



263,429
GAME PIECE OR SIMILAR ARTICLE
Warren A. Larrieu, P.O. Box 5164, Chicago, Ill. 60680
Filed Aug. 30, 1978, Ser. No. 938,270
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—51

263,430
COMBINED CARRYING TRAY AND SLIDING DRAWER
Laurie Berman, R.R. #1, Palgrave, Ontario, Canada (L0N 1P0)
Filed Oct. 2, 1979, Ser. No. 81,206
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D34—44



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TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF MARCH, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Abbott, Bernard J.; and Fukuda, David S., to Eli Lilly and Company. Derivatives of A-30912D nucleus. 4,320,053, Cl. 260-112.50R.

Abbott, Bernard J.; and Fukuda, David S., to Eli Lilly and Company. Derivatives of A-30912H nucleus. 4,320,054, Cl. 260-112.50R.

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Chau, Kue H.; and Beard, Robert A., 4,320,087, Cl. 422-69.000.

Abdulla, Riaz F., to Eli Lilly and Company. 3-Acyl-5-phenyl-4(1H)-pyridinones and their use as herbicides. 4,319,916, Cl. 71-94.000.

Abe, Katsuhiro; Tsuruoka, Mitsuo; Kiriyama, Shigeki; and Nakamori, Kazunobu, to Mitsubishi Petrochemical Co., Ltd. Aqueous dispersion of olefin resins and continuous process for preparing thereof. 4,320,041, Cl. 524-503.000.

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Mizuno, Den-ichi; Mitsuhashi, Hiroshi; Abe, Shigeru; and Hayashi, Koji, 4,320,119, Cl. 424-182.000.

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Saunders, Robert L., 4,319,376, Cl. 14-71.500.

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Advanced Integrated Design, Incorporated: *See*—
Cooley, Leslie F.; and Zopfy, Rainer K., 4,320,486, Cl. 369-14.000.

AECI Limited: *See*—
Engelbrecht, Andre D.; and van den Houten, Gerardus J., 4,320,100, Cl. 423-219.000.

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Ojima, Katsuhiro; Matsushita, Hajime; Fujimoto, Isao; Mizuno, Satosi; and Nishida, Tsuyoshi, 4,319,542, Cl. 118-100.000.

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Aisin Seiki Kabushiki Kaisha: *See*—
Hashimoto, Nobuyuki; and Satomoto, Atsushi, 4,319,693, Cl. 220-373.000.

Aitcin, Pierre C., to Societe Nationale de l'Amiante. Dry granular calcined magnetic fraction obtained from chrysotile asbestos tailings. 4,320,022, Cl. 252-62.590.

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Ajisawa, Yukiyoshi: *See*—
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Oka, Hiroyuki; Watanabe, Shingo; Watanabe, Yusyo; and Kurata, Masayuki, 4,319,670, Cl. 188-73.340.

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Aktiebolaget Volvo: *See*—
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Roy, Paul A., 4,319,750, Cl. 273-80.00B.

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Brown, Herbert C., 4,320,027, Cl. 252-188.000.

Aldrich, Robert G., to Halomet, Incorporated. Separation of high grade magnetite from fly ash. 4,319,988, Cl. 209-172.500.

Alexandrov, Vitaly V.; Bezlepkin, Anatoly I.; Konstantinov, Boris A.; Melnikova, Olga V.; Khomyak, Anatoly S.; Schukin, Lev I.; and Chukin, Marat S. Hollow-cathode gas-discharge tube. 4,320,321, Cl. 313-209.000.

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Thuries, Edmond; Sadoulet, Jean-Paul; and Sanchez, Alain, 4,320,372, Cl. 336-92.000.

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Alvarez, Joseph A., III; Bensadon, Joseph M.; Brennen, John F.; Brickman, Norman F.; and Krug, Robert W., to International Business Machines Corporation. Mechanism for synchronization of data ports in TDMA communication. 4,320,504, Cl. 370-104.000.

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Schulz, Galyn A., 4,320,162, Cl. 428-154.000.
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American Cyanamid Co.: *See—*
Balsley, Richard B.; and Marei, Abdel H., 4,320,130, Cl. 424-251.000.
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Anderson, John D. Monitor for an effluent disposal system. 4,319,998, Cl. 210-86.000.
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Schulz, Johann G.; Barie, Walter P., Jr.; and Eurich, James T., 4,320,223, Cl. 527-501.000.

Barkell, James W., Jr.: *See*—
Coyle, Forrest E.; and Barkell, James W., Jr, 4,320,371, Cl. 335-256.000.

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McMahan, Michael E.; Jackson, Gerald D.; and Barrington, Burchus Q., 4,319,633, Cl. 166-250.000.
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Barron, Edward W.: *See*—
Lund, Clarence A.; Barron, Edward W.; Holstin, Howard E.; and Sugino, Michael D., 4,319,395, Cl. 29-571.000.

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Barry, Marie T., executor: *See*—
Apotheker, David, deceased, 4,320,216, Cl. 526-248.000.

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Barthelemy, Andre J., to Societe Anonyme Automobiles Citroen; and Automobiles Peugeot. Device for controlling the rotation of a driven rotary member. 4,319,672, Cl. 192-0.02R.

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Ammermann, Eberhard; Rentzea, Costin; and Jung, Johann, 4,319,911, Cl. 71-76.000.
Denzigger, Walter; Herrle, Karl; and Schenck, Hans-Uwe, 4,320,114, Cl. 424-80.000.
Heinz, Gerhard; Richter, Peter; and Jun, Mong-Jon, 4,320,188, Cl. 430-281.000.
Horner, Michael; Irgang, Matthias; and Nissen, Axel, 4,320,228, Cl. 568-459.000.
Knerich, Werner; Boehm, Udo; Schulze-Berge, Klaus; and Brotzler, Roland, 4,320,429, Cl. 360-130.340.
Kropp, Rudolf; Fischer, Martin; and Halbritter, Klaus, 4,320,062, Cl. 260-343.600.
Merger, Franz; and Nestler, Gerhard, 4,320,235, Cl. 568-736.000.
Motz, Herbert; Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Hartmann, Hans-Joerg; Frischmann, Harald; Falk, Roland; Hack, Joachim; Velic, Milan; and Kopke, Helmut, 4,320,171, Cl. 428-423.100.
Theobald, Hans; Adolphi, Heinrich; Eicken, Karl; and Oeser, Heinz-Guenter, 4,320,122, Cl. 424-200.000.
Volkamer, Klaus; Lindner, Alfred; Merger, Franz; Wagner, Ulrich; Brunner, Erwin; Sandrock, Gerhard; and Strohmeyer, Max, 4,320,232, Cl. 568-697.000.

Bateman, James E.; and Connolly, John F., to National Research Development Corporation. Position-sensitive neutral particle sensor. 4,320,299, Cl. 250-374.000.

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Porta, Augusto; Kulhanek, Antonin; Groult, Alain; and Tourrier, Herve ', 4,319,973, Cl. 204-133.000.

Baudelet, Bernard; Suery, Michel; and Homer, Claude, to Pechiney Ugine Kuhlmann. Superplastic metal alloys having a high deformation rate. 4,319,935, Cl. 148-32.000.

Bauer, Frederick T.: *See*—
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Dalton, Augustine I., Jr.; and Bauer, Jeffery V., 4,320,102, Cl. 423-273.000.

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Baumgartner, Werner R. Manually-actuated contact switch arrangement for electronic watch. 4,320,485, Cl. 368-308.000.

Baun, Philip J., Jr.; and Merrick, Thomas B., to Bell Telephone Laboratories, Incorporated. Processing apparatus for data rate reduction. 4,320,505, Cl. 370-110.000.

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Priarone, Paolo; and St. John, Peter A., 4,319,842, Cl. 356-317.000.

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Ebneth, Harold; and Fitzky, Hans-Georg, 4,320,403, Cl. 343-756.000.
Reischl, Artur; and Wagner, Kuno, 4,320,208, Cl. 521-102.000.
Schwindt, Jurgen; Meyborg, Holger; Reiff, Helmut; and Konig, Klaus, 4,320,068, Cl. 260-453.0AB.
von Bonin, Wulf; Kleimann, Helmut; and Freitag, Hans-Albrecht, 4,320,067, Cl. 260-453.0AR.

Bayuga, Douglas A., to Firestone Tire & Rubber Company, The. Folded bead filler construction. 4,319,943, Cl. 156-136.000.

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Gaydon, Jean P.; and Haglon, Claude, 4,320,245, Cl. 13-12.000.
Hartmann, Hans; and Mauthe, Gerhard, 4,320,337, Cl. 323-358.000.
Kogelschatz, Ulrich, 4,320,301, Cl. 422-186.180.
Niemeyer, Lutz; and Ragaller, Klaus, 4,319,527, Cl. 102-314.000.

Beal, Ira W. Expendable pallet. 4,319,529, Cl. 108-51.300.

Beard, Robert A.: *See*—
Chau, Kue H.; and Beard, Robert A., 4,320,087, Cl. 422-69.000.

Beares, Allen G., to Black & Decker Inc. Plunge type router. 4,319,860, Cl. 409-182.000.

Beck, Mark E., to Eaton Corporation. Method of constructing thermostatic valve power element extension. 4,319,391, Cl. 29-157.10R.

Beckman Instruments, Inc.: *See*—
Cederatrand, Carl N.; and Chism, Hoke R., Jr., 4,320,297, Cl. 250-343.000.
Gurske, William A., 4,319,976, Cl. 204-180.00G.

Beckstead, Leo W.: *See*—
Queneau, Paul B.; Huggins, Dale K.; and Beckstead, Leo W., 4,320,095, Cl. 423-61.000.
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Beckwith, Edward K. Detachable fastener for joining impressions of a mouth onto a dental articulator. 4,319,875, Cl. 433-60.000.

Becton, Dickinson and Company: *See*—
Eldridge, William N., 4,319,582, Cl. 128-766.000.

Beden, Moses M. Hydraulic combustion engine. 4,319,546, Cl. 123-19.000.

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Fake, Charles S., 4,320,128, Cl. 424-250.000.

Bell, Alexis T.: *See*—
Osada, Yoshihito; Bell, Alexis T.; and Shen, Mitchel M., 4,320,219, Cl. 528-4.0AD.

Bell, Clifford J., to Westinghouse Electric Corp. Fluid circulating pump. 4,320,431, Cl. 361-23.000.

Bell, Dorothy L.: *See*—
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Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., to Colt Industries Operating Corp. Servo feed system for electrical discharge machining apparatus. 4,320,278, Cl. 219-69.00G.

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Bell Telephone Laboratories, Incorporated: *See*—
Arroyo, Candido J.; Cogelia, Nicholas J.; and Darsey, Ralph J., 4,319,940, Cl. 156-56.000.
Baun, Philip J., Jr.; and Merrick, Thomas B., 4,320,505, Cl. 370-110.000.
Brady, Douglas M.; and Gupta, Anita M., 4,320,535, Cl. 455-278.000.
Davidson, Robert P., 4,320,509, Cl. 371-25.000.
Gitlin, Richard D., 4,320,526, Cl. 375-118.000.
Haskell, Barin G., 4,320,514, Cl. 375-1.000.
Law, Hung-Fai S.; and Lopez, Alexander D., 4,319,396, Cl. 29-571.000.
McDonald, Henry S., 4,320,258, Cl. 179-18.00B.
Scerbo, Louis J.; and Starace, Jeremia P., 4,320,261, Cl. 179-98.000.
Shoji, Masakazu, 4,320,409, Cl. 357-42.000.
Smith, Arnold R., 4,319,939, Cl. 156-56.000.
Vratny, Frederick, 4,319,967, Cl. 204-29.000.

Bellanger, Maurice G.; and Gaillard, Jean, to Telecommunications Radioelectriques et Telephoniques T.R.T. Filter for analog signals. 4,320,362, Cl. 333-165.000.

Bellut, Hans: *See*—
Baltruschat, Helmut; Bellut, Hans; and Schnurbusch, Horst, 4,319,918, Cl. 71-118.000.

Beloit Corporation: *See*—
Frye, Kenneth G., 4,319,442, Cl. 53-447.000.

Bemis Manufacturing Company: *See*—
Bemis, Richard A.; and Kelly, Gordon, 4,319,365, Cl. 4-236.000.

Bemis, Richard A.; and Kelly, Gordon, to Bemis Manufacturing Company. No tool toilet seat hardware. 4,319,365, Cl. 4-236.000.

Bemis, Richard A., to Sprague Electric Company. AC Etching of aluminum capacitor foil. 4,319,972, Cl. 204-129.430.

Bendix Corporation, The: *See*—
Caruso, Peter J., 4,320,389, Cl. 340-825.300.
Richman, Jay L., 4,320,512, Cl. 371-52.000.

Benjamin, Delmar E.: *See*—
Britt, Ronald L.; and Benjamin, Delmar E., 4,319,792, Cl. 312-245.000.

Benko, Pal; Messmer, Andras; Hajos, Gyorgy; Batori, Sandor; Petocz, Lujza; Kosoczky, Iboly; and Gorog, Peter, to Edyt Gyogyszervegyeszeti Gyar. Pyrido[3,2-e]-as-triazines. 4,320,127, Cl. 424-249.000.

Bennett, Joe B., to Owens-Corning Fiberglas Corporation. Pipe coupling with internal stop collar and elastomeric pipe separators interlocked therewith. 4,319,775, Cl. 285-383.000.

Bensadon, Joseph M.: *See*—
Alvarez, Joseph A., III; Bensadon, Joseph M.; Brennen, John F.; Brickman, Norman F.; and Krug, Robert W., 4,320,504, Cl. 370-104.000.

Benteler, Hubertus; Hansen, Rainer; Olszewski, Egon; and Wecker, Ferdinand, to Benteler-Werke AG. Apparatus for producing a corrugated tube. 4,319,471, Cl. 72-59.000.

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Benteler, Hubertus; Hansen, Rainer; Olszewski, Egon; and Wecker, Ferdinand, 4,319,471, Cl. 72-59.000.

Berard, Louis N.; and Stein, Leonard A., to Devices Development Corporation. Electronically controlled safety mechanism for highway exit ramp. 4,320,380, Cl. 340-39.000.

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Bank, Mikhail U.; Prozorov, Valery I.; Rubichev, Nikolai A.; Odnolko, Mikhail V.; Rozenberg, Evgeny A.; Bessonov, Alexei F.; Berezjuk, Iraida K.; and Guzikov, Sergei D., 4,320,532, Cl. 455-226.000.

Berg, Alexander; and Eckmayer, Zdenek, to Carl Freudenberg, Firma. Method for making collagen sponge for medical and cosmetic uses. 4,320,201, Cl. 435-265.000.

Berkley, James R. Multiple pressure boiler with energy recovery system. 4,319,458, Cl. 60-693.000.

Bernasconi, Raymond; Ferrini, Pier G.; Goschke, Richard; and Gosteli, Jacques, to Ciba-Geigy Corporation. Oxothia compounds. 4,320,138, Cl. 424-275.000.

Bernat, Charles A., to Triangle PWC, Inc. Barrier for molded female power cord connector bodies. 4,319,800, Cl. 339-218.00R.

Berney, Jean-Claude, to Jean-Claude Berney SA. Electronic watch with a device for controlling and driving the day of the month. 4,320,476, Cl. 368-28.000.

Bernstein, Philip; and Coffey, James P., to MPD Technology Corporation. Production of a cell electrode system. 4,320,184, Cl. 429-217.000.

Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; and Clark, William D. K., to MPD Technology Corporation. Production of a cell electrode system. 4,320,185, Cl. 429-217.000.

Bertolacini, Ralph J.: *See*—
Pellet, Regis J.; and Bertolacini, Ralph J., 4,319,984, Cl. 208-138.000.

Bertossa, Guiseppe, to Inventa AG fur Forschung und Patentverwertung Zurich. Process for the production of cobaltocen. 4,320,066, Cl. 260-439.0CY.

Berwix, Joachim: *See*—
Meissen, Ralf; Loser, Friedrich; Berwix, Joachim; and Krischer, Christof, 4,320,395, Cl. 340-726.000.

Bessonov, Alexei F.: *See*—
Bank, Mikhail U.; Prozorov, Valery I.; Rubichev, Nikolai A.; Odnolko, Mikhail V.; Rozenberg, Evgeny A.; Bessonov, Alexei F.; Berezjuk, Iraida K.; and Guzikov, Sergei D., 4,320,532, Cl. 455-226.000.

Bethards, Charles W.: *See*—
Null, Michael W.; Bethards, Charles W.; and Burzynski, William A., 4,320,255, Cl. 179-1.00G.

Bezlepkin, Anatoly I.: *See*—
Alexandrov, Vitaly V.; Bezlepkin, Anatoly I.; Konstantinov, Boris A.; Melnikova, Olga V.; Khomyak, Anatoly S.; Schukin, Lev I.; and Chukin, Marat S., 4,320,321, Cl. 313-209.000.

Bfg Glassgroup: *See*—
Nicolas, Maurice; and Bacconnet, Eugene, 4,320,164, Cl. 428-167.000.

Bierling, Rudolf, to Audi NSU Auto Union Aktiengesellschaft. Liquid-cooled internal combustion engine. 4,319,547, Cl. 123-41.290.

Biggiogera, Giancarlo; and Saba, Manlio, to Societa Italina Telecomunicazioni Siemens S.p.A. Line repeater for telephone system using radio links. 4,320,265, Cl. 179-170.00R.

Bijlenga, Gosse, to Gist-Brocades N.V. Rabies virus vaccine. 4,320,115, Cl. 424-84.000.

Bilewski, Friedhelm: *See*—
Warren, Richard J.; and Bilewski, Friedhelm, 4,319,506, Cl. 83-347.000.

Birchall, James D.; and Morton, Michael J., to Imperial Chemical Industries Limited. Process for preparing shaped body of alumina. 4,320,074, Cl. 264-8.000.

Bird, Robert E., to Modern Engineering Company, Inc. Safety shut-off valve. 4,319,604, Cl. 137-498.000.

Birrell, Stewart H.; and Hedgewick, Peter, to International Tools (1973) Limited. Child-resistant closure and container assembly including improved outer cap. 4,319,690, Cl. 215-220.000.

Bishop, Charles R., to United States of America, Army. Mechanical noise suppressor for small rocket motors. 4,319,660, Cl. 181-222.000.

Biter, William J., to Westinghouse Electric Corp. Method of forming solar cells by grid contact isolation. 4,320,154, Cl. 427-75.000.

Bittner, Friedrich; Voigt, Carl; and Kleinschmit, Peter, to Degussa Aktiengesellschaft. Process for the production of hydrogen cyanide. 4,320,104, Cl. 423-375.000.

Bjorck, Karl E. L., to Astra-Ewos AB. Foodstuffs, animal feeding stuffs and pharmaceutical preparations containing an antibacterial system. 4,320,116, Cl. 424-129.000.

Bjorkman, Carl P.: *See*—
Brandt, Gunnar; Bjorkman, Carl P.; and Ekemar, Carl S. G., 4,320,203, Cl. 501-87.000.

Black & Decker Inc.: *See*—
Beares, Allen G., 4,319,860, Cl. 409-182.000.

Black, James F.; Courtney, Richard A.; Grudkowski, Thomas W.; Norusis, Philip T.; and Wood, Harry R., to United Technologies Corporation. Fundamental, longitudinal, thickness mode bulk wave resonator. 4,320,365, Cl. 333-187.000.

Black, Malcolm H.; Frenkel, Alexander D.; and Roberts, Peter T. N-[(phenyl(oxy or amino))thioacetyl]-1,2-diamine anthropodicides. 4,320,142, Cl. 424-300.000.

Blaskowski, Henry J., to Combustion Engineering, Inc. Apparatus for mixing char-ash into coal stream. 4,319,888, Cl. 48-77.000.

Blaszczak, Larry C., to Eli Lilly and Company. Process for penicillin epimerization. 4,320,055, Cl. 260-239.100.

Blattel, Raymond J.: *See*—
White, Jack R.; Godwin, Charles L.; and Blattel, Raymond J., 4,320,289, Cl. 250-214.00R.

Bleiweiss, Arthur F.; Wilkes, Robert J.; and Topley, Trevor E., to Dominion Auto Accessories Limited. Rotating warning lamp. 4,320,385, Cl. 340-133.000.

Bloom, Allen: *See*—
Crandall, Richard S.; and Bloom, Allen, 4,320,489, Cl. 369-111.000.

Blurton, Claire M.: *See*—
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Blurton, Richard R.: *See*—
Jeppson, Morris R., 4,319,856, Cl. 404-79.000.

Boberski, William G.: *See*—
Nowakowski, Peter M.; Boberski, William G.; and Seiner, Jerome A., 4,319,926, Cl. 106-74.000.

Boehm, Udo: *See*—
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Boeing Company, The: *See*—
Corwin, Rudolph E.; Riemer, Dietrich E.; and Stanbery, Billy J., 4,320,250, Cl. 136-256.000.

Bofinger, Gerhard; and Wolfle, Wilfried, to Aesculap-Werke Aktiengesellschaft. Skull trepanation drill. 4,319,577, Cl. 128-305.100.

Bogen, Wolfgang. Wear-resistant magnetic heads. 4,320,427, Cl. 360-122.000.

Boice, William E. Salad dressing bottle and top stopper with individual server. 4,319,614, Cl. 141-381.000.

Bonte, Charles A., to Storz Instrument Company. Universal trephine handle. 4,319,575, Cl. 128-305.000.

Borrup, Ronald J., to Sierracin Corporation. Heater element. 4,320,286, Cl. 219-549.000.

Boston, Farwell C.: *See*—
Trentham, H. Lee; Crow, John H.; and Boston, Farwell C., 4,320,101, Cl. 423-243.000.

Botvin, Michael N.: *See*—
Baker, Roupen, Jr.; and Botvin, Michael N., 4,319,366, Cl. 4-323.000.

Boudin, Jacques. Pressure equalization means. 4,319,605, Cl. 137-590.000.

Boujet, Jean-Pierre, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Hyperfrequency filter. 4,320,367, Cl. 333-209.000.

Bouvard, Jacques: *See*—
Bachman, Charles W.; and Bouvard, Jacques, 4,320,451, Cl. 364-200.000.
Bouvot, Jean-Francois: *See*—
Moulene, Jean-Louis; and Bouvot, Jean-Francois, 4,319,714, Cl. 236-99.00G.
Bowen, Edwin D., to General Dynamics Corp./Electronics Division. Multiple ring microstrip antenna. 4,320,402, Cl. 343-700.0MS.
Bowers, Johnney G.: *See*—
Nelli, Joseph R.; Bowers, Johnney G.; and Conway, Eustace R., 4,320,105, Cl. 423-421.000.
Bowes, Kenneth F., to Bunker Ramo Corporation. Stain relief for fiber optic connectors. 4,319,802, Cl. 350-96.200.
Bowey, John J. Motor overload safety device. 4,320,317, Cl. 310-68.00B.
Bowman, Samuel J.; and Bowman, William F. Chimney cleaner. 4,319,378, Cl. 15-162.000.
Bowman, William F.: *See*—
Bowman, Samuel J.; and Bowman, William F., 4,319,378, Cl. 15-162.000.
Boyajian, Benjamin K. Palladium-based dental alloy containing indium and tin. 4,319,877, Cl. 433-207.000.
Bradbury, Stanley A., to Crouse-Hinds Company. Lightweight cable ladder. 4,319,724, Cl. 248-49.000.
Brady, Douglas M.; and Gupta, Anita M., to Bell Telephone Laboratories, Incorporated. Adaptive interference suppression arrangement. 4,320,535, Cl. 455-278.000.
Brandenburg, Darrell L., to General Motors Corporation. Antiglare rear view mirror. 4,319,806, Cl. 350-281.000.
Brandt Company, The: *See*—
Heilhecker, Joe K.; and Schoeneman, David D., 4,319,410, Cl. 34-75.000.
Brandt, Gunnar; Bjorkman, Carl P.; and Ekemar, Carl S. G., to Sandvik Aktiebolag. Ceramic alloy. 4,320,203, Cl. 501-87.000.
Braun AG: *See*—
Voigt, Gottfried, 4,320,283, Cl. 219-369.000.
Braun, Ernst; and Braun, Gert, to Halbach & Braun. Conveying trough connector and mining machine guide rail bridge. 4,319,783, Cl. 299-43.000.
Braun, Gert: *See*—
Braun, Ernst; and Braun, Gert, 4,319,783, Cl. 299-43.000.
Braunovic, Milenko: *See*—
Narancic, Vojislav; and Braunovic, Milenko, 4,320,374, Cl. 337-162.000.
Brearley, Malcolm; and Adamson, John, to Lucas Industries Limited. Anti-skid brake control system. 4,320,460, Cl. 364-426.000.
Brejcha, Robert J., to R/B Manufacturing, Inc. Surface processing machine. 4,319,434, Cl. 51-177.000.
Bremmer, Bart J.: *See*—
Reierson, Robert L.; Bremmer, Bart J.; and Hanafin, Joseph W., 4,320,024, Cl. 252-78.300.
Brendel, Albert E., to Sensor Developments, Inc. Load cell scale. 4,319,650, Cl. 177-156.000.
Brendel, Thomas E.: *See*—
Hannett, William J.; and Brendel, Thomas E., 4,319,459, Cl. 62-77.000.
Brennen, John F.: *See*—
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Brenner, Walter, to Standard Products Company, The. Radiation curing of flocked composite structures. 4,319,942, Cl. 156-72.000.
Brent Chemicals Corporation: *See*—
Cristobal, Fely B.; and Newsbaum, Robert W., 4,320,026, Cl. 252-139.000.
Brickman, Norman F.: *See*—
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Bridgestone Tire Company Limited: *See*—
Motomura, Kenichi; Watanabe, Shigeo; and Sogi, Toshiyuki, 4,319,621, Cl. 152-362.0CS.
Suzuki, Yasuo, 4,319,618, Cl. 152-185.000.
Brine, Charles J.: *See*—
Austin, Paul R.; Zikakis, John P.; and Brine, Charles J., 4,320,150, Cl. 426-2.000.
Bristol-Myers Company: *See*—
Robillard, Jean J., 4,320,193, Cl. 430-503.000.
Tomita, Koji; Tsukiura, Hiroshi; and Kawaguchi, Hiroshi, 4,320,199, Cl. 435-121.000.
Britt, Ronald L.; and Benjamin, Delmar E., to Celotex Corporation, The. Shelf structure. 4,319,792, Cl. 312-245.000.
Brobeil, Karl R., to United States of America, Army. Gas generator-actuated fire suppressant mechanism. 4,319,640, Cl. 169-28.000.
Brock, Helmut E., to Young, David C. Chain saw sighting device. 4,319,404, Cl. 33-263.000.
Broning, Manfred: *See*—
Lauckhardt, Gerhard; Fichtner, Rudi; and Broning, Manfred, 4,319,373, Cl. 12-8.300.
Brotzler, Roland: *See*—
Knerich, Werner; Boehm, Udo; Schulze-Berge, Klaus; and Brotzler, Roland, 4,320,429, Cl. 360-130.340.
Brower, Boyd G.; and Shaffer, John W., to GTE Products Corporation. Connect switch. 4,320,440, Cl. 362-13.000.
Brown, Boveri & Cie AG: *See*—
Hausler, Michael; and Sadex, Kadry, 4,320,444, Cl. 363-35.000.
Brown, Emmett J., Jr.: *See*—
Wilson, Darlene; Brown, Emmett J., Jr.; and Landry, Lawrence J., Jr., 4,319,884, Cl. 23-230.00R.
Brown, Floyd A., Jr.; and Saraf, Dilip G., to SRI International. Differential amplifying system with bootstrapping. 4,320,351, Cl. 330-260.000.
Brown, Herbert C., to Aldrich-Boranes, Inc. Process for producing highly stabilized borane-tetrahydrofuran solutions. 4,320,027, Cl. 252-188.000.
Brown, John E.; to West & Sons Engineers Limited. Spherical seal element. 4,319,756, Cl. 277-58.000.
Brown, Melvin H., to Aluminum Company of America. Coal fuel mixture resulting in reduced sulfurous pollutants. 4,319,885, Cl. 44-15.00R.
Brown, Richard A.; Fixman, Myles; and Lesher, Dale L., to FMC Corporation. Recovery of vanadium from acidic solutions thereof. 4,320,097, Cl. 423-63.000.
Brown, Robert E., to General Electric Company. Illuminated keyboard for electronic devices and the like. 4,320,268, Cl. 200-5.00A.
Brown, Thomas L.: *See*—
Bugler, Thomas W., III; Lillig, Donald J.; Brown, Thomas L.; and Kinney, Ohler L., Jr., 4,320,073, Cl. 261-112.000.
Brown, William F., to Weston Research Corporation. Coating compositions for metal casting molds. 4,319,925, Cl. 106-38.270.
Brownell, David A. Decorative butterfly and method of construction. 4,319,941, Cl. 156-61.000.
Browning Engineering Corporation: *See*—
Browning, James A., 4,319,647, Cl. 175-14.000.
Browning, James A., to Browning Engineering Corporation. Flame drill channelling method and apparatus for reducing noise and dust levels. 4,319,647, Cl. 175-14.000.
Brunaud, Daniel: *See*—
Coussau, Jean; and Brunaud, Daniel, 4,319,961, Cl. 376-260.000.
Brunner, Erwin: *See*—
Volkamer, Klaus; Lindner, Alfred; Merger, Franz; Wagner, Ulrich; Brunner, Erwin; Sandrock, Gerhard; and Strohmeyer, Max, 4,320,232, Cl. 568-697.000.
Brunswick Corporation: *See*—
Staerzl, Richard E., 4,320,335, Cl. 320-59.000.
Buck, Daniel C.; and Sinon, Gregory K., to Westinghouse Electric Corp. Microwave pulse spectrum control. 4,320,399, Cl. 343-17.10R.
Buffie, Albert E. Fuel system for internal combustion engines. 4,319,554, Cl. 123-559.000.
Buford, William H., Jr.; and Wagner, John J., to Marquardt Corporation, The. Warhead detector. 4,320,298, Cl. 250-358.00R.
Bugler, Thomas W., III; Lillig, Donald J.; Brown, Thomas L.; and Kinney, Ohler L., Jr., to Marley Company, The. Film fill sheets for water cooling tower having integral spacer structure. 4,320,073, Cl. 261-112.000.
Buhler, Fritz: *See*—
Scheuchzer, Fredy; and Buhler, Fritz, 4,319,416, Cl. 37-104.000.
Buhmann, Ulrich: *See*—
Puttner, Reinhold; Buhmann, Ulrich; and Joppien, Hartmut, 4,320,125, Cl. 424-248.510.
Bukala, Alexander E., to Littelfuse, Inc. Electrical relay device and method of making the same. 4,320,369, Cl. 335-202.000.
Bull, Frederick G., to Gist-Brocades N.V. Process for the production of carrier particles from yeast cells and for producing diagnostic agents therefrom and test kits containing such agents. 4,320,194, Cl. 435-7.000.
Bulova Watch Co., Inc.: *See*—
Baumgartner, Werner R., 4,320,477, Cl. 368-64.000.
Bunker Ramo Corporation: *See*—
Bowes, Kenneth F., 4,319,802, Cl. 350-96.200.
Bunner, Thomas A., to FerreTronics, Inc. Gas sensor. 4,319,482, Cl. 73-153.000.
Burckardt, Karl-Heinz: *See*—
Bahr, Dietrich J.; and Burckardt, Karl-Heinz, 4,320,330, Cl. 318-685.000.
Burdet, Michel, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Electro-optical analog digital display. 4,320,484, Cl. 368-239.000.
Burleigh Instruments, Inc.: *See*—
Gornall, William S., 4,319,843, Cl. 356-346.000.
Burlington Industries, Inc.: *See*—
Schwartz, William C., 4,320,163, Cl. 428-158.000.
Burmeister, Robert A.; Greene, Paul E.; and Hiakes, Ronald, to Hewlett-Packard Company. Optical fiber coating. 4,319,803, Cl. 350-96.330.
Burroughs Corporation: *See*—
Goldis, Alexander; Sellen, Kenneth R.; and Banka, Eugene F., 4,320,407, Cl. 346-140.00R.
Woodward, Thomas R., 4,320,525, Cl. 375-110.000.
Burton, Pamela M.: *See*—
White, Abraham, deceased; Nestor, John J.; Jones, Gordon H.; and Burton, Pamela M., 4,320,118, Cl. 424-177.000.
Burton, Willie T., Jr., to Harris Corporation. Bit synchronizer. 4,320,515, Cl. 375-4.000.
Burzynski, William A.: *See*—
Null, Michael W.; Bethards, Charles W.; and Burzynski, William A., 4,320,255, Cl. 179-1.00G.
Bushnell, Joseph H., to McGraw-Edison Company. Secondary valve arrester. 4,320,436, Cl. 361-128.000.
C. W. Zumbiel Company, The: *See*—
Wright, William H.; and Kruse, John M., 4,319,682, Cl. 206-180.000.

Cabot Corporation: *See—*
Menashi, Jameel; Rappas, Alkis S.; and Douglas, Donald A., 4,320,094, Cl. 423-56.000.
Cairo, Anthony C.: *See—*
Barker, Charles E.; Cairo, Anthony C.; Bauer, Frederick T.; and Jackson, Auzville, Jr., 4,319,711, Cl. 236-46.00R.
Calderoni, Felice J.: *See—*
Hillebrecht, Wayne R.; and Calderoni, Felice J., 4,319,912, Cl. 71-86.000.
Caldwell, Edward N., to Dalen Products, Inc. Shelf-mounting system, parts therefor and method of making the same. 4,319,531, Cl. 108-152.000.
Cambio, Orlando D., to Respiratory Care, Inc. Blow molded container having an insert molded in situ. 4,319,701, Cl. 222-541.000.
Campbell, Diane, administratrix: *See—*
Michaud, Roger P.; and Campbell, Douglas B., deceased, 4,319,873, Cl. 431-24.000.
Campbell, Douglas B., deceased: *See—*
Michaud, Roger P.; and Campbell, Douglas B., deceased, 4,319,873, Cl. 431-24.000.
Candor, James T. Method and apparatus for electrostatically forming a layer of material from a slurry thereof. 4,319,407, Cl. 34-1.000.
Canon Kabushiki Kaisha: *See—*
Hashimoto, Teiji, 4,319,823, Cl. 354-234.000.
Ichiyanagi, Toshikazu, 4,320,518, Cl. 375-17.000.
Iura, Yukio; Yamamichi, Masayoshi; Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, 4,319,814, Cl. 354-33.000.
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,319,828, Cl. 355-3.00R.
Murata, Shinji; Torigai, Akiyoshi; Morikawa, Teruo; Nakaoka, Masaki; and Sone, Yoshiaki, 4,319,836, Cl. 355-55.000.
Sado, Ichiro, 4,320,396, Cl. 340-799.000.
Tezuka, Nobuo; and Hirohata, Michio, 4,319,821, Cl. 354-230.000.
Tezuka, Nobuo; and Hirohata, Michio, 4,319,822, Cl. 354-234.000.
Cantillo, Humberto. Bathroom space expander. 4,319,367, Cl. 4-353.000.
Carl Freudenberg, Firma: *See—*
Berg, Alexander; and Eckmayer, Zdenek, 4,320,201, Cl. 435-265.000.
Carl Zeiss-Stiftung: *See—*
Rossmann, Dieter, 4,319,824, Cl. 354-272.000.
Carle & Montanari S.p.A.: *See—*
Salicini, Sandro, 4,319,495, Cl. 74-405.000.
Carlson, Gerald L.; and Hickam, William M., to Westinghouse Electric Corp. Technique for monitoring SO_3, H_2SO_4 in exhaust gases containing SO_2. 4,319,966, Cl. 204-1.00T.
Carlson, Richard B. Engine enclosure for tractor. 4,319,653, Cl. 180-89.170.
Carlson, Robert W. Vehicle acceleration/deceleration warning system. 4,320,384, Cl. 340-71.000.
Carmaco, Inc.: *See—*
Carter, Jackie L.; and Carter, Jerry D., 4,319,643, Cl. 172-311.000.
Carrier Corporation: *See—*
Hannett, William J.; and Brendel, Thomas E., 4,319,459, Cl. 62-77.000.
Martin, Gregory W., 4,319,472, Cl. 72-122.000.
Carrigan, William J.; and Spector, George. Pickup. 4,319,379, Cl. 15-400.000.
Carroll, James C., to Westinghouse Electric Corp. Control circuit. 4,320,449, Cl. 363-135.000.
Carroll, James J.: *See—*
Rich, Joseph A.; and Carroll, James J., 4,320,269, Cl. 200-144.00B.
Carter, Ernest E., Jr.: *See—*
Baker, Eugene E.; and Carter, Ernest E., Jr., 4,319,638, Cl. 166-355.000.
Carter, Jackie L.; and Carter, Jerry D., to Carmaco, Inc. Front folding agricultural tool bar with movable carriage to which wings coupled. 4,319,643, Cl. 172-311.000.
Carter, Jerry D.: *See—*
Carter, Jackie L.; and Carter, Jerry D., 4,319,643, Cl. 172-311.000.
Carter, Russell P., Jr.: *See—*
Krishnan, Sivaram; Carter, Russell P., Jr.; and Kroshefsky, Robert D., 4,320,049, Cl. 524-94.000.
Carter, Stephen W.; Friedman, Harvey S.; and Lippert, Irving S., to Polaroid Corporation. Method for assembling photographic self-processing apparatus. 4,319,827, Cl. 354-304.000.
Cartmell, James V., to NDM Corporation. Reusable medical electrode having disposable electrolyte carrier. 4,319,579, Cl. 128-640.000.
Caruso, Peter J., to Bendix Corporation, The. Electromechanical decoder. 4,320,389, Cl. 340-825.300.
Casas, Baldomero, to American Cyanamid Company. Process for the manufacture of phthalocyanines. 4,320,059, Cl. 260-314.500.
Cash, Michael J., to Honeywell Inc. Thick film resistor. 4,320,165, Cl. 428-213.000.
Cassella Aktiengesellschaft: *See—*
Piesch, Steffen; Engelhardt, Friedrich; Wille, Herbert; Weidemuller, Wolf; and Meyer, Artur, 4,320,060, Cl. 260-317.000.
Castagne, Rene: *See—*
Gloanec, Maurice; and Castagne, Rene, 4,320,313, Cl. 307-243.000.
Cavazza, Claudio. Pharmaceutical composition for parenteral nutrition comprising L-carnitine or acyl L-carnitines. 4,320,145, Cl. 424-316.000.
Cecere, Mirella; Gozzo, Franco; Lorusso, Simone; and Garavaglia, Carlo, to Montedison S.p.A. Antibotrytical pyrazolo-triazol-triones. 4,320,132, Cl. 424-269.000.
Cederstrand, Carl N.; and Chism, Hoke R., Jr., to Beckman Instruments, Inc. Split detector. 4,320,297, Cl. 250-343.000.
Celanese Corporation: *See—*
Keith, Charles H.; and Karstedt, Bruce D., 4,319,591, Cl. 131-359.000.
Celender, Richard A.; and Fedorovich, Alexander. Multi-size pill dispenser. 4,319,700, Cl. 222-511.000.
Celotex Corporation, The: *See—*
Britt, Ronald L.; and Benjamin, Delmar E., 4,319,792, Cl. 312-245.000.
Pryor, Jerry C.; and Jenson, Roger E., 4,319,921, Cl. 75-65.00R.
Centra-Burkle GmbH & Co., Firma: *See—*
Knoll, Alois, 4,320,310, Cl. 307-141.000.
Centro Ricerche Fiat S.p.A.: *See—*
Giovinazzo, Giovanni; and Varrone, Piergiorgio, 4,320,392, Cl. 340-365.00C.
Cerny, Milos: *See—*
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Ceskoslovenska akademie ved: *See—*
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,319,808, Cl. 350-358.000.
Cessou, Maurice: *See—*
Jaffrennou, Bernard; and Cessou, Maurice, 4,319,858, Cl. 405-68.000.
Chai, Hui-Min: *See—*
Lapp, John; Mason, Marco J.; Gauger, Gary A.; and Chai, Hui-Min, 4,320,034, Cl. 252-567.000.
Champaneria, Ashok J.; and Gupta, Mohinder K., to Du Pont de Nemours, E. I., and Company. Treatment for bulked continuous filament yarns. 4,319,388, Cl. 28-257.000.
Chance, Davey J.: *See—*
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,320,278, Cl. 219-69.00G.
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,320,279, Cl. 219-69.00P.
Chang, Edmond. Rotatable seesaw device. 4,319,746, Cl. 272-30.000.
Chaplanov, Boris V.: *See—*
Koshelev, Vladimir N.; Meshkov, Vyacheslav; and Chaplanov, Boris V., 4,319,867, Cl. 418-113.000.
Chasek, Norman E. Method and apparatus that nearly instantaneously samples, processes and sorts received signals from very large numbers of radar and radio emitters for frequency and angle of arrival analysis. 4,320,400, Cl. 343-100.0CL.
Chatterjee, Ananda M., to Shell Oil Company. Amide nucleating agents for butene-1 polymer compositions. 4,320,209, Cl. 525-6.000.
Chau, Kue H.; and Beard, Robert A., to Abbott Laboratories. Laboratory assay device. 4,320,087, Cl. 422-69.000.
Chauvin, Yves; Gaillard, Jean; Leger, Gerard; and Van Landeghem, Hugo, to Institut Francais du Petrole. Process for producing propene and/or butene oligomers. 4,320,243, Cl. 585-521.000.
Chekroun, Claude, to Societe d'Etude du Radant. Microwave phase shifter and its application to electronic scanning. 4,320,404, Cl. 343-854.000.
Chemische Werke Huels Aktiengesellschaft: *See—*
Diebel, Klaus, 4,320,025, Cl. 252-78.500.
Chemische Werke Huls AG: *See—*
Hentschel, Bernhard; Ziebarth, Jurgen; Coenen, Alfred; Kosswig, Kurt; and Praun, Ferdinand V., 4,320,106, Cl. 423-424.000.
Kaufhold, Manfred; and Gaube, Johann, 4,320,237, Cl. 568-909.000.
Chemische Werke Huls Aktiengesellschaft: *See—*
Baltruschat, Helmut; Bellut, Hans; and Schnurbusch, Horst, 4,319,918, Cl. 71-118.000.
Chemla, Daniel; Cot, Louis; Jerphagnon, Jean; and Durand, Jean. Structure of the insulator—semiconductor type. 4,320,178, Cl. 428-698.000.
Cherrington, Martin O., to Reading & Bates Construction Co. Process for drilling underground arcuate paths and installing production casings, conduits, or flow pipes therein. 4,319,648, Cl. 175-53.000.
Chevron Research Company: *See—*
Vaughan, Ronald J., 4,320,015, Cl. 252-33.600.
Chi, Jim-Yong: *See—*
Gatos, Harry C.; and Chi, Jim-Yong, 4,320,247, Cl. 136-255.000.
Chief Industries, Inc.: *See—*
Mullen, Richard J., 4,319,602, Cl. 137-202.000.
Chiron S.A.: *See—*
Fradin, Maurice, 4,320,152, Cl. 426-618.000.
Chism, Hoke R., Jr.: *See—*
Cederstrand, Carl N.; and Chism, Hoke R., Jr., 4,320,297, Cl. 250-343.000.
Christoffersen, Sten R.; Gregersen, Johan C.; and Larsen, Mogens B., to A/S N. Foss Electric. Method and apparatus for determining at least one component of a sample of grain, seed, or another particulate material. 4,319,491, Cl. 73-662.000.
Chrysler Corporation: *See—*
Youngdale, Ralph A., 4,319,768, Cl. 280-668.000.
Chukin, Marat S.: *See—*
Alexandrov, Vitaly V.; Bezlepkin, Anatoly I.; Konstantinov, Boris A.; Melnikova, Olga V.; Khomyak, Anatoly S.; Schukin, Lev I.; and Chukin, Marat S., 4,320,321, Cl. 313-209.000.
Chung, Hun-Hwei. Centering device. 4,319,400, Cl. 33-169.00C.
Ciaffone, John T., to Warner-Lambert Company. Straight edge razor. 4,319,399, Cl. 30-32.000.
Ciba-Geigy Corporation: *See—*
Bernasconi, Raymond; Ferrini, Pier G.; Goschke, Richard; and Gosteli, Jacques, 4,320,138, Cl. 424-275.000.
Koci, Zdenek; and Schaub, Andres, 4,319,881, Cl. 8-532.000.

Paioni, Romeo, 4,320,137, Cl. 424-274.000.
Citizen Watch Co., Ltd.: *See—*
Sekine, Mitsuo; and Nishikubo, Yasuhiko, 4,320,479, Cl. 368-74.000.
Clapp, Daniel W., to Frazier Industrial Company. Storage rack. 4,319,689, Cl. 211-182.000.
Claringbull, Peter, to Conzinc Riotinto Malaysia Sendirian Berhard. Apparatus for water jet and impact drilling and mining. 4,319,784, Cl. 299-64.000.
Clark, Cecily M.: *See—*
Rassias, John N.; and Clark, Cecily M., 4,319,440, Cl. 52-438.000.
Clark, William D. K.: *See—*
Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; and Clark, William D. K., 4,320,185, Cl. 429-217.000.
Cleanair Combustion Systems Ltd.: *See—*
Gram, Anker, 4,319,900, Cl. 62-42.000.
Clinton, Robert E. Canvas frame spring tension wire clamp apparatus. 4,319,420, Cl. 40-156.000.
Clyburn, C. Wayne, to James David Mfg. Corp. Capotasto. 4,319,512, Cl. 84-318.000.
CMI Corporation: *See—*
Rosenbaum, Glen F., 4,319,765, Cl. 280-504.000.
Coatings for Industry, Inc.: *See—*
Collins, Glenn A., Jr.; and Klotz, James M., 4,319,924, Cl. 106-14.120.
Coats, Kenneth R. Guide and deflecting device. 4,319,445, Cl. 56-63.000.
Coburn Optical Industries, Inc.: *See—*
Henry, David W.; and Mathews, Herbert H., 4,319,846, Cl. 356-401.000.
Coca-Cola Company, The: *See—*
Credle, W. S., 4,319,441, Cl. 53-131.000.
Coe, Richard A.: *See—*
Larson, Gordon C.; and Coe, Richard A., 4,319,960, Cl. 376-272.000.
Coenen, Alfred: *See—*
Hentschel, Bernhard; Ziebarth, Jurgen; Coenen, Alfred; Kosswig, Kurt; and Praun, Ferdinand V., 4,320,106, Cl. 423-424.000.
Coffey, James P.: *See—*
Bernstein, Philip; and Coffey, James P., 4,320,184, Cl. 429-217.000.
Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; and Clark, William D. K., 4,320,185, Cl. 429-217.000.
Cogelia, Nicholas J.: *See—*
Arroyo, Candido J.; Cogelia, Nicholas J.; and Darsey, Ralph J., 4,319,940, Cl. 156-56.000.
Cole, Morton S. Antistaling baking composition. 4,320,151, Cl. 426-18.000.
Colley, Peter S.; and Martin, Roy W., to University of Washington, The Board of Regents of the. Method for detecting air emboli in the blood in an intracorporeal blood vessel. 4,319,580, Cl. 128-661.000.
Collins, Glenn A., Jr.; and Klotz, James M., to Coatings for Industry, Inc. Low-temperature curing coating composition. 4,319,924, Cl. 106-14.120.
Collins, Kent L.: *See—*
Fix, Paul; and Collins, Kent L., 4,319,906, Cl. 65-59.260.
Collonia, Harald; Mann, Arnold; and Haub, Martin, to VDO Adolf Schindling AG. Device for the control of the traveling speed of a motor vehicle. 4,319,658, Cl. 180-271.000.
Colt Industries Operating Corp: *See—*
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,320,278, Cl. 219-69.00G.
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,320,279, Cl. 219-69.00P.
Combustion Engineering, Inc.: *See—*
Blaskowski, Henry J., 4,319,888, Cl. 48-77.000.
Commissariat a l'Energie Atomique: *See—*
Eloy, Jean-Francois, 4,320,295, Cl. 250-281.000.
Nicolas, Maurice; and Bacconnet, Eugene, 4,320,164, Cl. 428-167.000.
Compagnie Francaise des Petroles: *See—*
Jegousse, Michel J.; and De Sivry, Bruno J. M., 4,319,709, Cl. 228-213.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Boujet, Jean-Pierre, 4,320,367, Cl. 333-209.000.
Le Dieu, Bernard; and Thiebaut, Georges, 4,320,501, Cl. 370-63.000.
Compagnie International pour l'Informatique Cii Honeywell Bull (Societe Anonyme): *See—*
Pinard, Patrick, 4,319,745, Cl. 271-305.000.
Compeau, Edward E., deceased (by Compeau, Patricia J., legal representative); and Winnale, James A., to General Motors Corporation. Tether belt for passive shoulder belt system. 4,319,769, Cl. 280-808.000.
Compeau, Patricia J., legal representative: *See—*
Compeau, Edward E., deceased; and Winnale, James A., 4,319,769, Cl. 280-808.000.
Connolly, John F.: *See—*
Bateman, James E.; and Connolly, John F., 4,320,299, Cl. 250-374.000.
Conoco Inc.: *See—*
White, Preston S., 4,320,023, Cl. 252-75.000.
Constantinides, Nick J.: *See—*
United States of America, National Aeronautics and Space Administration; and Constantinides, Nick J., 4,320,397, Cl. 343-7.500.
Control Data Corporation: *See—*
Desmonds, Daniel J., 4,320,464, Cl. 364-766.000.
Conway, Eustace R.: *See—*
Nelli, Joseph R.; Bowers, Johnney G.; and Conway, Eustace R., 4,320,105, Cl. 423-421.000.
Conzinc Riotinto Malaysia Sendirian Berhard: *See—*
Claringbull, Peter, 4,319,784, Cl. 299-64.000.
Cook, James A., Jr.; and Keim, William A., to PPG Industries, Inc. Process for preparing chlorothiolformates. 4,320,070, Cl. 260-455.00A.
Cook, Leslie J. Boat trailer. 4,319,862, Cl. 414-471.000.
Cook, Richard B., to FMC Corporation. Derivatized agarose and method of making and using same. 4,319,975, Cl. 204-180.00G.
Cooley, Leslie F.; and Zopfy, Rainer K., to Advanced Integrated Design, Incorporated. Transferring information signals from a first to a second recording medium. 4,320,486, Cl. 369-14.000.
Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Rubber compositions containing N-(carboxyalkyl)maleamic acid. 4,320,173, Cl. 428-457.000.
Correa, Joseph F., III. Portable convertible case and work tray. 4,319,683, Cl. 206-349.000.
Corteg, Walter V.; Gillies, Jack K.; and Sauer, Alfred B., to General Motors Corporation. Vehicle trailer hitch. 4,319,766, Cl. 280-511.000.
Corwin, Rudolph E.; Riemer, Dietrich E.; and Stanbery, Billy J., to Boeing Company, The. Electrodes for concentrator solar cells, and methods for manufacture thereof. 4,320,250, Cl. 136-256.000.
Cot, Louis: *See—*
Chemla, Daniel; Cot, Louis; Jerphagnon, Jean; and Durand, Jean, 4,320,178, Cl. 428-698.000.
Cottriall, Peter F., to Crosfield Electronics Limited. Image reproduction equipment. 4,320,419, Cl. 358-258.000.
Coufal, Hansperter: *See—*
Banziger, Walter; and Coufal, Hanspeter, 4,320,326, Cl. 315-307.000.
Coulter Systems Corporation: *See—*
Weber, Harold J., 4,319,544, Cl. 118-647.000.
Courtney, Richard A.: *See—*
Black, James F.; Courtney, Richard A.; Grudkowski, Thomas W.; Norusis, Philip T.; and Wood, Harry R., 4,320,365, Cl. 333-187.000.
Coussau, Jean; and Brunaud, Daniel, to Framatome. Fixing device for detachably fixing a heating element. 4,319,961, Cl. 376-260.000.
Coyle, Forrest E.; and Barkell, James W., Jr., to Westinghouse Electric Corp. Tractive solenoid device. 4,320,371, Cl. 335-256.000.
Crandall, Richard S.; and Bloom, Allen, to RCA Corporation. Reversible optical storage medium and a method for recording information therein. 4,320,489, Cl. 369-111.000.
Credle, W. S., to Coca-Cola Company, The. Automatic dispensing system. 4,319,441, Cl. 53-131.000.
Crilly, Paul B.: *See—*
McDonald, John F.; Scarton, Henry A.; Kennedy, Warren C.; and Crilly, Paul B., 4,320,282, Cl. 219-137.0PS.
Cristobal, Fely B.; and Newsbaum, Robert W., to Brent Chemicals Corporation. Alkaline detergent composition and method of inhibiting discoloration of said detergent composition. 4,320,026, Cl. 252-139.000.
Crivello, James V., to General Electric Company. UV Curable compositions and substrates treated therewith. 4,319,974, Cl. 204-159.110.
Crone, William J., Jr.; and Wright, John P., to Midwestern Industries, Inc. Material separating machine. 4,319,991, Cl. 209-255.000.
Crosby, Ivan K., to University of Virginia Alumni Patents Foundation, The. Method and apparatus for permanent epicardial pacing or drainage of pericardial fluid and pericardial biopsy. 4,319,562, Cl. 128-1.00R.
Crosfield Electronics Limited: *See—*
Cottriall, Peter F., 4,320,419, Cl. 358-258.000.
Crounse, Nathan N.; and Heitz, James R., to Sterling Drug Inc. Synergistic insecticidal compositions. 4,320,140, Cl. 424-283.000.
Crouse-Hinds Company: *See—*
Bradbury, Stanley A., 4,319,724, Cl. 248-49.000.
Crow, John H.: *See—*
Trentham, H. Lee; Crow, John H.; and Boston, Farwell C., 4,320,101, Cl. 423-243.000.
Cruickshank, David G.; and Webb, Robert, to Western Electric Company, Inc. Laser bonding technique and article formed thereby. 4,320,281, Cl. 219-121.0LD.
Crumrine, Ralph J.: *See—*
Wulfsberg, Paul G.; Fredrickson, Dennis L.; Triplett, Gregory L.; Crumrine, Ralph J.; and Cunningham, Cole E., 4,320,357, Cl. 331-16.000.
CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Barberis, Giulio; Lambarelli, Livio; and Micca, Giorgio, 4,320,500, Cl. 370-60.000.
CTS Corporation: *See—*
Greve, James E.; and Zdanys, John, Jr., 4,320,267, Cl. 200-4.000.
Ibrahim, Shawki; and Elsner, James E., 4,320,438, Cl. 361-401.000.
Ctyroky, Jiri: *See—*
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,319,808, Cl. 350-358.000.
Cunningham, Cole E.: *See—*
Wulfsberg, Paul G.; Fredrickson, Dennis L.; Triplett, Gregory L.; Crumrine, Ralph J.; and Cunningham, Cole E., 4,320,357, Cl. 331-16.000.
Cutter, John W. Heart pulse monitoring apparatus. 4,319,581, Cl. 128-707.000.
Cutts, Glynn D., to Pandrol Limited. Removing rail clips from a railway track. 4,319,392, Cl. 29-402.080.

D.A.S. Pumps (Proprietary) Limited: *See—*
Willers, Albertus V. Z.; and Neser, Willem J., 4,319,699, Cl. 222-175.000.

Dahlstrom, Norris A.; and Littmann, Martin F., to Armco Inc. Process for production of oriented silicon steel. 4,319,936, Cl. 148-111.000.

Daiwa Can Company, Limited: *See—*
Yano, Shunji; and Takahashi, Tsunehisa, 4,319,930, Cl. 134-10.000.

D'Alelio, Gaetano F.; and Waitkus, Phillip A., to Plastics Engineering Company. Polymerization products of polyimide derivatives having acetylenic terminal amide groups. 4,320,217, Cl. 526-285.000.

Dalen Products, Inc.: *See—*
Caldwell, Edward N., 4,319,531, Cl. 108-152.000.

Dalton, Augustine I., Jr.; and Bauer, Jeffery V., to Air Products and Chemicals, Inc. Method of stabilizing hydrogen peroxide solutions. 4,320,102, Cl. 423-273.000.

Daniels, Richard G.; Walton, Richard S.; and Yamanouchi, Roy K., to Motorola, Inc. Digital watch. 4,320,478, Cl. 368-69.000.

Dannatt, Hugh S., to Pitney Bowes Inc. Heated fuser roll. 4,320,284, Cl. 219-469.000.

Darsey, Ralph J.: *See—*
Arroyo, Candido J.; Cogelia, Nicholas J.; and Darsey, Ralph J., 4,319,940, Cl. 156-56.000.

David, Pierre A. Openwork crate for transporting bottles or the like. 4,319,685, Cl. 206-507.000.

Davidson, Robert P., to Bell Telephone Laboratories, Incorporated. LSI Circuit logic structure including data compression circuitry. 4,320,509, Cl. 371-25.000.

Davis, Richard K.; and Konrad, Charles E., to General Electric Company. Battery state-of-charge indicator. 4,320,334, Cl. 320-48.000.

Davis, William F.; and Tsutsumi, Masataka, to Midwestern Industries, Inc. Material separating machine. 4,319,992, Cl. 209-275.000.

Davy-Loewy Limited: *See—*
Gronbech, Robert W., 4,319,474, Cl. 72-229.000.

Day, Lawrence, to Spitfire Tool and Machine Co. Polishing fixture. 4,319,432, Cl. 51-131.400.

De Barth, Robert E. Aerosol can pressure releaser. 4,319,697, Cl. 222-80.000.

Debrus, Philippe, to Societe Anonyme D.B.A. Five-position hydraulic actuating apparatus. 4,319,609, Cl. 137-625.630.

Deepsea Ventures, Inc.: *See—*
Latimer, John P.; and Garland, Charles, 4,319,414, Cl. 37-58.000.
Latimer, John P., 4,319,782, Cl. 299-1.000.

De Felice, Stephen L. Carnitine and its use in reducing cardiac toxicity and as a synergist with cytostats. 4,320,110, Cl. 424-10.000.

Degelman Industries Ltd.: *See—*
Degelman, Wilfred J., 4,319,641, Cl. 171-63.000.

Degelman, Wilfred J., to Degelman Industries Ltd. Rock picker. 4,319,641, Cl. 171-63.000.

DeGraffenreid, Howard T. Coalescer or filter end cap. 4,320,005, Cl. 210-232.000.

Degussa Aktiengesellschaft: *See—*
Bittner, Friedrich; Voigt, Carl; and Kleinschmit, Peter, 4,320,104, Cl. 423-375.000.

Dehn, Rudolph A., to RTE Corporation. Cooking utensil for uniform heating in microwave oven. 4,320,274, Cl. 219-10.55E.

Deja, Edmund P., to Trippensee Corporation. Reversing thermometer frame. 4,319,486, Cl. 73-343.00B.

de Jager, Frank: *See—*
Muilwijk, Dirk; Dekker, Cornelis B.; and de Jager, Frank, 4,320,499, Cl. 375-17.000.

Dejaiffe, Robert; and Kells, Edward L., to Forty-Eight Insulations, Inc. Melting furnace for the production of mineral wool insulation. 4,320,244, Cl. 13-6.000.

Dekker, Cornelis B.: *See—*
Muilwijk, Dirk; Dekker, Cornelis B.; and de Jager, Frank, 4,320,499, Cl. 375-17.000.

DeMarinis, Robert M., to SmithKline Corporation. 2-Aminotetralin compounds, pharmaceutical compositions and method of producing central alpha$_1$ agonist activity. 4,320,148, Cl. 424-330.000.

Denzigger, Walter; Herrle, Karl; and Schenck, Hans-Uwe, to BASF Aktiengesellschaft. Manufacture of aqueous polyvinylpyrrolidone-iodine solutions. 4,320,114, Cl. 424-80.000.

DerMott, Raymond W., to Schlumberger Technology Corp. Explosive safe-arming system for perforating guns. 4,319,526, Cl. 102-310.000.

De Sivry, Bruno J. M.: *See—*
Jegousse, Michel J.; and De Sivry, Bruno J. M., 4,319,709, Cl. 228-213.000.

Desmonds, Daniel J., to Control Data Corporation. Binary divider with carry-save adders. 4,320,464, Cl. 364-766.000.

Detwiler, Barry R.: *See—*
Rello, Michael J.; and Detwiler, Barry R., 4,319,850, Cl. 400-247.000.

Deutsche Texaco Aktiengesellschaft: *See—*
Rietsch, Eike, 4,320,471, Cl. 367-49.000.

deVeer, John A., to International Business Machines Corp. Distributed priority resolution system. 4,320,502, Cl. 370-85.000.

Devices Development Corporation: *See—*
Berard, Louis N.; and Stein, Leonard A., 4,320,380, Cl. 340-39.000.

Dexter Corporation, The: *See—*
Snyder, Charles E.; and Elston, Colin, 4,319,956, Cl. 162-146.000.

DIA-Nielsen GmbH Zubehor fur die Messtechnik: *See—*
Freude, Paul, 4,320,405, Cl. 346-140.00A.

Diafoil Company Limited: *See—*
Watanabe, Masamichi; and Sakamoto, Seiji, 4,320,207, Cl. 521-54.000.

Diamond, Sidney. Ceiling grid suspension display device. 4,319,421, Cl. 40-617.000.

Diebel, Klaus, to Chemische Werke Huels Aktiengesellschaft. Cavitation-inhibiting, nonfreezing, cooling and/or heat transfer fluids. 4,320,025, Cl. 252-78.500.

Diebold, James L.: *See—*
Freed, Meier E.; and Diebold, James L., 4,320,057, Cl. 260-239.30B.

Dieter Graesslin Feinwerktechnik: *See—*
Schonhardt, Peter, 4,320,480, Cl. 368-78.000.

Dieter, Norman H., Jr.; and Drelinger, Sanford, to Micro-Acoustics Corporation. Variable weight phonograph cartridge. 4,320,492, Cl. 369-170.000.

Dietrich, James L. Subharmonic pumped mixer circuit. 4,320,536, Cl. 455-325.000.

Digital House, Ltd.: *See—*
Roberts, William H.; and Rutkowski, Paul A., 4,320,453, Cl. 364-200.000.

Digital Recording Corporation: *See—*
Russell, James T., 4,320,488, Cl. 369-44.000.

Dimon, Donald F. Time shared frequency conversion system. 4,320,531, Cl. 455-203.000.

Dingler, Geoffrey L.; Jarvis, Wilbur W.; and Spiegel, Raymond W., to Whirlpool Corporation. Soil separator drain valve. 4,319,598, Cl. 134-57.00D.

Dingler, Geoffrey L.; Jarvis, Wilbur W.; and Spiegel, Raymond W., to Whirlpool Corporation. Vertical soil separator for dishwasher. 4,319,599, Cl. 134-104.000.

Dischert, Robert A.; Nagle, Eugene M.; and Williams, James J., Jr., to RCA Corporation. Technique for optimally encoding digitally encoded video signals. 4,320,416, Cl. 358-133.000.

Ditmanson, Henry A., to Ditmanson, Robert C.; Ditmanson, Richard A.; and Donaldson, Helen. Router attachment for ornamenting a workpiece. 4,319,615, Cl. 144-144.00R.

Ditmanson, Richard A.: *See—*
Ditmanson, Henry A., 4,319,615, Cl. 144-144.00R.

Ditmanson, Robert C.: *See—*
Ditmanson, Henry A., 4,319,615, Cl. 144-144.00R.

Dlugos, Daniel F., to Pitney Bowes Inc. Postage value calculator with expanded memory versatility. 4,320,461, Cl. 364-466.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Mahncke, Jurgen, 4,319,375, Cl. 14-2.400.

Dodd, N. Ray. Refrigerated container. 4,319,464, Cl. 62-371.000.

Dohshita, Hidetoshi: *See—*
Ishii, Yoshiya; Fujitani, Nobuyuki; and Dohshita, Hidetoshi, 4,319,550, Cl. 123-198.0DB.

Dollenmayer, William L., to International Business Machines Corporation. Print hammer for high speed impact printer. 4,319,849, Cl. 400-144.200.

Dominion Auto Accessories Limited: *See—*
Bleiweiss, Arthur F.; Wilkes, Robert J.; and Topley, Trevor E., 4,320,385, Cl. 340-133.000.

Donaldson, Helen: *See—*
Ditmanson, Henry A., 4,319,615, Cl. 144-144.00R.

Donohoe, David G., to Aquarian Coatings Corp. Cymbal-mounting device. 4,319,514, Cl. 84-421.000.

Dorawala, Tansukhlal G.: *See—*
Love, Richard F.; Dorawala, Tansukhlal G.; and Kerr, Edwin R., 4,320,240, Cl. 585-419.000.

Dorzok, Gary J.: *See—*
Nehrbass, Joel M.; and Dorzok, Gary J., 4,319,694, Cl. 220-407.000.

Dotz, Karl H., to Hoffmann-La Roche Inc. Process for preparing vitamin K. 4,320,065, Cl. 260-438.50R.

Douglas, Donald A.: *See—*
Menashi, Jameel; Rappas, Alkis S.; and Douglas, Donald A., 4,320,094, Cl. 423-56.000.

Douwens, Robert: *See—*
Hayward, John; and Douwens, Robert, 4,319,566, Cl. 128-203.260.

Dow Chemical Company, The: *See—*
Hoffman, Dwight K., 4,320,221, Cl. 528-69.000.
Reierson, Robert L.; Bremmer, Bart J.; and Hanafin, Joseph W., 4,320,024, Cl. 252-78.300.
Vivian, Thomas A., 4,320,014, Cl. 252-8.55C.
Wilson, Darlene; Brown, Emmett J., Jr.; and Landry, Lawrence J., Jr., 4,319,884, Cl. 23-230.00R.

Doyle, Gerald, to Exxon Research & Engineering Co. Methanol homologation using iron-cobalt carbonyl cluster catalyst. 4,320,230, Cl. 568-487.000.

Doyle, James E.: *See—*
Anderson, Hugh C.; Doyle, James E.; and Lembke, Russell B., 4,320,042, Cl. 523-144.000.

Dozier, Henry L.; and Williamson, John C., to Weyerhaeuser Company. Method and apparatus for forming a reinforced half-slotted container. 4,319,878, Cl. 493-131.000.

Drapac, Michael J., to Rockwell International Corporation. Sliding power supply for RF power amplifier. 4,320,350, Cl. 330-202.000.

Drelinger, Sanford: *See—*
Dieter, Norman H., Jr.; and Drelinger, Sanford, 4,320,492, Cl. 369-170.000.

Dresser Industries, Inc.: *See—*
Angehrn, Jorg A., 4,320,470, Cl. 367-34.000.
Lichtenberg, Heinz D., 4,320,340, Cl. 324-221.000.

Drossler, Peter, to DSI-Sportartikel GmbH. Ski pole. 4,319,770, Cl. 280-824.000.

DSI-Sportartikel GmbH: *See—*
Drossler, Peter, 4,319,770, Cl. 280-824.000.

Dual Gebruder Steidinger GmbH & Co.: *See—*
Lehmann, Rudiger, 4,320,494, Cl. 369-225.000.
Duenke, Clarence G., to San Angelo Electric Service Company. High voltage transformer bushing fuse and arrester arrangement. 4,320,432, Cl. 361-39.000.
Dufek, Wayne L.: *See—*
McCarthy, Charles C.; Ackman, Mark E.; Dufek, Wayne L.; and Kopicky, Edward E., 4,320,388, Cl. 340-825.540.
Dumbs, Hermann: *See—*
Weis, Martin; and Dumbs, Hermann, 4,319,624, Cl. 164-401.000.
Dumolo, David, to Fordath Limited. Foundry binders based on a phenolic reaction product. 4,320,037, Cl. 523-142.000.
Dunham, Philip N.; Martin, Armand; and Peck, Gregory G. A., to Prevent-A-Theft International Ltd. Abrasive stenciling apparatus. 4,319,524, Cl. 101-128.000.
Dunnavant, William R.: *See—*
Gruber, Bruce A.; Langer, Heimo J.; and Dunnavant, William R., 4,320,218, Cl. 526-308.000.
Duo-Fast Corporation: *See—*
Geist, Bernard W.; and Novak, Raymond F., 4,319,705, Cl. 227-120.000.
Du Pont de Nemours, E. I., and Company: *See—*
Apotheker, David, deceased, 4,320,216, Cl. 526-248.000.
Barron, Eugene R., 4,319,447, Cl. 57-6.000.
Champaneria, Ashok J.; and Gupta, Mohinder K., 4,319,388, Cl. 28-257.000.
Harmuth. Charles M., 4,320,048, Cl. 523-333.000.
Scribner, Richard M., 4,320,136, Cl. 424-274.000.
Durand, Jean: *See—*
Chemla, Daniel; Cot, Louis; Jerphagnon, Jean; and Durand, Jean, 4,320,178, Cl. 428-698.000.
Durham, Kenneth M., Jr.; Tarpley, Roy W.; and Rehn, Larry A., to Texas Instruments Incorporated. Method of automated fluid flow measurement. 4,319,483, Cl. 73-204.000.
Durran, Donald A., to United States of America, Air Force. Beam alignment system. 4,319,839, Cl. 356-153.000.
Dutro, Lyle V. Vendor for flat articles. 4,319,695, Cl. 221-213.000.
Dutta, Anand S.; Gormley, James J.; Hayward, Christopher F.; Morley, John S.; and Stacey, Gilbert J., to Imperial Chemical Industries Limited. Polypeptide. 4,320,117, Cl. 424-177.000.
Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Schambeck, Herbert, 4,319,374, Cl. 14-1.000.
E. J. Brooks Company: *See—*
Moberg, Sigurd M., 4,319,776, Cl. 292-322.000.
Eagle-Picher Industries, Inc.: *See—*
Baker, Roy D., 4,319,713, Cl. 236-96.000.
Eaton Corporation: *See—*
Beck, Mark E., 4,319,391, Cl. 29-157.10R.
Hoppie, Lyle O., 4,319,655, Cl. 180-165.000.
Johnson, Roger R.; Kleinhagen, Charles W., Jr.; Neuman, Richard F.; and Winckler, Peter S., 4,319,668, Cl. 188-72.400.
Kavick, Edward M., 4,319,774, Cl. 285-256.000.
Liston, Novell D., 4,319,662, Cl. 182-13.000.
Ebauches S.A.: *See—*
Ruedin, Yves, 4,320,190, Cl. 430-296.000.
Ebneth, Harold; and Fitzky, Hans-Georg, to Bayer Aktiengesellschaft. Use of metallized sheet-form textile materials as reflection and polarization control media for microwaves. 4,320,403, Cl. 343-756.000.
Eckmayer, Zdenek: *See—*
Berg, Alexander; and Eckmayer, Zdenek, 4,320,201, Cl. 435-265.000.
Eckner, Gunter, to Hoechst Aktiengesellschaft. Process for coating metal tubes and use of the coated tubes. 4,319,610, Cl. 138-131.000.
Ecodyne Corporation: *See—*
Arndt, William A., 4,320,072, Cl. 261-111.000.
Edyt Gyogyszervegyeszeti Gyar: *See—*
Benko, Pal; Messmer, Andras; Hajos, Gyorgy; Batori, Sandor; Petocz, Lujza; Kosoczky, Iboly, and Gorog, Peter, 4,320,127, Cl. 424-249.000.
Eguchi, Seiji: *See—*
Suzuki, Seigo; Eguchi, Seiji; and Moriya, Yoshiaki, 4,320,454, Cl. 364-200.000.
Ehrreich, John E., to Ercon, Inc. Novel electroconductive compositions and powder for use therein. 4,319,920, Cl. 75-0.50A.
Eicken, Karl: *See—*
Theobald, Hans; Adolphi, Heinrich; Eicken, Karl; and Oeser, Heinz-Guenter, 4,320,122, Cl. 424-200.000.
Ekemar, Carl S. G.: *See—*
Brandt, Gunnar; Bjorkman, Carl P.; and Ekemar, Carl S. G., 4,320,203, Cl. 501-87.000.
Ekholm, Pertti: *See—*
Suovaniemi, Osmo A.; Ekholm, Pertti; and Partanen, Paul, 4,319,841, Cl. 356-244.000.
Eldridge, William N., to Becton, Dickinson and Company. Fluid flow control device for use with an evacuated blood collection container. 4,319,582, Cl. 128-766.000.
Electric Power Research Institute, Inc.: *See—*
Rich, Joseph A.; and Carroll, James J., 4,320,269, Cl. 200-144.00B.
Weldon, William F., 4,320,318, Cl. 310-219.000.
Electron, Inc.: *See—*
Riggs, Dean D.; and McCarthy, David M., 4,319,674, Cl. 194-4.00R.
Elgner, Claude F., to Salga Associates Limited & Company. Air conduits and process therefor. 4,320,084, Cl. 264-540.000.
Eli Lilly and Company: *See—*
Abbott, Bernard J.; and Fukuda, David S., 4,320,052, Cl. 260-112.50R.
Abbott, Bernard J.; and Fukuda, David S., 4,320,053, Cl. 260-112.50R.
Abbott, Bernard J.; and Fukuda, David S., 4,320,054, Cl. 260-112.50R.
Abdulla, Riaz F., 4,319,916, Cl. 71-94.000.
Blaszczak, Larry C., 4,320,055, Cl. 260-239.100.
Miller, Jean C.; and Thompson, Gerald L., 4,320,058, Cl. 260-244.400.
Eloy, Jean-Francois, to Commissariat a l'Energie Atomique. Panoramic ion detector. 4,320,295, Cl. 250-281.000.
Elsner, Ernst: *See—*
Zaiser, Wolfgang; and Elsner, Ernst, 4,319,466, Cl. 64-27.00L.
Elsner, James E.: *See—*
Ibrahim, Shawki; and Elsner, James E., 4,320,438, Cl. 361-401.000.
Elston, Colin: *See—*
Snyder, Charles E.; and Elston, Colin, 4,319,956, Cl. 162-146.000.
Elstrom Electronic AG: *See—*
Banziger, Walter; and Coufal, Hanspeter, 4,320,326, Cl. 315-307.000.
Emilson, Carl G. Heel binding for cross-country skis. 4,319,767, Cl. 280-614.000.
Emonet, Henri. Rotary tool drive system for a jack hammer. 4,319,646, Cl. 173-111.000.
Endo, Tadakazu; Suzuki, Hirotsugu; and Takahashi, Masanori, to Toray Industries, Inc. Thermal-insulating nonwoven bulky product. 4,320,166, Cl. 428-283.000.
Endo, Yoshinori, to Yamaha Hatsudoki Kabushiki Kaisha. Induction control system for internal combustion engine. 4,319,553, Cl. 123-432.000.
Energy Development Associates, Inc.: *See—*
Hart, Thomas G., 4,320,179, Cl. 429-15.000.
Engdahl, Jean. Personal dosimeter with reminder time. 4,320,393, Cl. 340-600.000.
Engel, Michael R.; and Aasen, Linda L., to Minnesota Mining and Manufacturing Company. Use of fluorinated beta-diketones as antiplaque agents. 4,320,149, Cl. 424-331.000.
Engelbrecht, Andre D.; and van den Houten, Gerardus J., to AECI Limited. Purification of gas mixtures. 4,320,100, Cl. 423-219.000.
Engelhardt, Friedrich: *See—*
Piesch, Steffen; Engelhardt, Friedrich; Wille, Herbert; Weidemuller, Wolf; and Meyer, Artur, 4,320,060, Cl. 260-317.000.
Enger, Carl C., to General Mills, Inc. Micro pH electrode assembly for wire transmission. 4,319,578, Cl. 128-635.000.
Epik, Alexei P.: *See—*
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonova, Grigory V., deceased; Samsonova, Nadezhda A., administrator; Samsonova, Natalya G., administrator; and Samsonova, Evgeny G., administrator, 4,319,715, Cl. 239-81.000.
Epoch Company, Ltd.: *See—*
Kurushima, Minoru; and Esaka, Akio, 4,319,751, Cl. 273-85.00E.
Ercon, Inc.: *See—*
Ehrreich, John E., 4,319,920, Cl. 75-0.50A.
Erkkila, John H.: *See—*
Peterson, Phillip R.; Gavrielides, Athanasios; and Erkkila, John H., 4,320,359, Cl. 372-18.000.
Esaka, Akio: *See—*
Kurushima, Minoru; and Esaka, Akio, 4,319,751, Cl. 273-85.00E.
Escher Wyss Limited: *See—*
Marchioro, Ignazio, 4,319,389, Cl. 29-116.0AD.
Marchioro, Ignazio; and Stotz, Wolf-Gunter, 4,319,522, Cl. 100-162.00B.
Esper, Friedrich; and Wiedenmann, Hans-Martin, to Robert Bosch GmbH. Method to manufacture soft magnetic pressed bodies. 4,320,080, Cl. 264-111.000.
Esquivel Yglesias, Rafael. Programmable agenda. 4,319,771, Cl. 283-2.000.
Ettinger, Donald N. Protective neck apparatus. 4,319,362, Cl. 2-415.000.
Eurich, James T.: *See—*
Schulz, Johann G.; Barie, Walter P., Jr.; and Eurich, James T., 4,320,223, Cl. 527-501.000.
Evans, Henry J. Apparatus and method for cigarette rolling and holding. 4,319,588, Cl. 131-280.000.
Everest & Jennings, Inc.: *See—*
Rodaway, Keith S., 4,319,381, Cl. 16-44.000.
Everett, Charles J., to Robertshaw Controls Company. Control device and method of making the same. 4,320,294, Cl. 250-231.00P.
Exide Corporation: *See—*
Qureshi, Nawaz M., 4,320,183, Cl. 429-211.000.
Exxon Research & Engineering Co.: *See—*
Doyle, Gerald, 4,320,230, Cl. 568-487.000.
Hatch, Walter H.; Balinsky, George J.; and Ackerman, Steve, 4,319,893, Cl. 55-60.000.
Rello, Michael J.; and Detwiler, Barry R., 4,319,850, Cl. 400-247.000.
Ryan, Douglas R., 4,319,962, Cl. 196-14.500.
Shaw, Donald L.; McGlothlin, Quentin T.; O'Brien, Barry M.; Keck, John W.; and Freyberger, Wilfred L., 4,319,987, Cl. 209-166.000.
Waghorne, Robert H.; Gernand, Martin O.; and Pafford, Bernie J., 4,319,892, Cl. 55-60.000.

Fake, Charles S., to Beecham Group Limited. Chromanone derivatives and compositions containing them. 4,320,128, Cl. 424-250.000.
Falanga, Bruno J.; and Macdonald, David I., to Western Electric Co., Inc. Recovery of gold and/or palladium from an iodide-iodine etching solution. 4,319,923, Cl. 75-108.000.
Falk, Roland: *See—*
Motz, Herbert; Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Hartmann, Hans-Joerg; Frischmann, Harald; Falk, Roland; Hack, Joachim; Velic, Milan; and Kopke, Helmut, 4,320,171, Cl. 428-423.100.
Farazi, Perry; and Frank, Howard L., to Sun Electric Corporation. Apparatus and method for simulation testing of an anti-block system. 4,320,506, Cl. 371-20.000.
Farmitalia Carlo Erba S.p.A.: *See—*
Pellegata, Renato; and Gandolfi, Carmelo, 4,320,143, Cl. 424-305.000.
Farmstead Industries, Division of Farmhand, Inc.: *See—*
Hesler, Andrew B., 4,319,678, Cl. 198-746.000.
Farr Company: *See—*
Labadie, Paul A., 4,319,897, Cl. 55-302.000.
Fedorovich, Alexander: *See—*
Celender, Richard A.; and Fedorovich, Alexander, 4,319,700, Cl. 222-511.000.
Fellowes Manufacturing Company: *See—*
Klaus, Gerald R., 4,319,795, Cl. 312-330.00R.
Fencl, Vernon R., to Grotnes Metalforming Systems, Inc. Automotive rim roll forming drive system. 4,320,327, Cl. 318-50.000.
Fender, C. Leo. Splitter switch for humbucking musical instrument pick-ups. 4,319,510, Cl. 84-1.150.
Ferguson, William G.: *See—*
Griffiths, Charles R.; and Ferguson, William G., 4,320,309, Cl. 307-132.00T.
Ferraro, Joseph P.: *See—*
Sznopek, John L.; Lostak, Charles; Heisler, Robert W.; Ferraro, Joseph P.; and Kazienko, Henry J., 4,319,950, Cl. 156-475.000.
FerreTronics, Inc.: *See—*
Bunner, Thomas A., 4,319,482, Cl. 73-153.000.
Ferrini, Pier G.: *See—*
Bernasconi, Raymond; Ferrini, Pier G.; Goschke, Richard; and Gosteli, Jacques, 4,320,138, Cl. 424-275.000.
Ferwerda, Jerry J.: *See—*
Thissen, Christopher P.; Ferwerda, Jerry J.; Tweet, Milford J.; and Hatfield, Ronald D., 4,319,949, Cl. 156-446.000.
Fica, Ladislav; and Cerny, Milos, to Skoda, oborovky podnik. Circuit arrangement for contactless transmission of temperature information from a fuel assembly of a nuclear reactor. 4,319,958, Cl. 376-247.000.
Fichtner, Rudi: *See—*
Lauckhardt, Gerhard; Fichtner, Rudi; and Broning, Manfred, 4,319,373, Cl. 12-8.300.
Fickel, R. Gene, to UOP Inc. Simulated countercurrent sorption process employing ion exchange resins with periodic backflushing. 4,319,929, Cl. 127-46.200.
Fields, Larry D., to Yardney Electric Corporation. Valve assembly and valve sealing element. 4,319,607, Cl. 137-625.500.
Findlay, Hugh T., to International Business Machines Corporation. Polyurethane ribbon for non-impact printing. 4,320,170, Cl. 428-336.000.
Firestone Tire & Rubber Company, The: *See—*
Bayuga, Douglas A., 4,319,943, Cl. 156-136.000.
Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Offset printing machine ink homogenizing and drying system. 4,319,525, Cl. 101-350.000.
Fischer, Martin: *See—*
Kropp, Rudolf; Fischer, Martin; and Halbritter, Klaus, 4,320,062, Cl. 260-343.600.
Fisher, Joseph. Ceramic beads for heaters. 4,320,253, Cl. 174-138.00J.
Fisher, Michael H.; and Linn, Bruce O., to Merck & Co., Inc. Pyromellitic diimide complexes. 4,320,129, Cl. 424-251.000.
Fitzky, Hans-Georg: *See—*
Ebneth, Harold; and Fitzky, Hans-Georg, 4,320,403, Cl. 343-756.000.
Fitzpatrick-Ellis, John F., to Automotive Products Limited. End face thrust seals. 4,319,757, Cl. 277-81.00R.
Fix, Paul; and Collins, Kent L., to Westinghouse Electric Corp. Method and apparatus for press sealing an arc tube body section. 4,319,906, Cl. 65-59.260.
Fixman, Myles: *See—*
Brown, Richard A.; Fixman, Myles; and Lesher, Dale L., 4,320,097, Cl. 423-63.000.
Flashstar Limited: *See—*
Godfrey, Roger D., 4,319,732, Cl. 248-346.000.
Fleagle, Barry K. Dinghy cockpit. 4,319,534, Cl. 114-39.000.
Fleetwood Enterprises, Inc.: *See—*
Leonard, Larry W.; and Shikler, Arie, 4,319,778, Cl. 296-166.000.
Flintkote Company, The: *See—*
Segal, Robert M., 4,319,927, Cl. 106-89.000.
Fliri, Hans: *See—*
Hamberger, Helmut; Stutz, Peter; Schoiz, Dieter; and Fliri, Hans, 4,320,133, Cl. 424-269.000.
Flory, Thomas A.: *See—*
Scantland, Joseph F.; and Flory, Thomas A., 4,319,869, Cl. 425-38.000.
FMC Corporation: *See—*
Brown, Richard A.; Fixman, Myles; and Lesher, Dale L., 4,320,097, Cl. 423-63.000.
Cook, Richard B., 4,319,975, Cl. 204-180.00G.
Fogarty, A. Edward: *See—*
Fogarty, Bonnie R.; and Fogarty, A. Edward, 4,319,532, Cl. 112-79.500.
Fogarty, Bonnie R.; and Fogarty, A. Edward, to Hasbro Industries, Inc. Toy sewing machine. 4,319,532, Cl. 112-79.500.
Fogel, Sidney J.: *See—*
Katz, Jerome; and Fogel, Sidney J., 4,319,964, Cl. 202-172.000.
Foltyn, Jan; Kuda, Vladimir; Vasicek, Vladimir; and Koci, Jaroslav, to Vyzkumny a vyvojovy ustav Zavodu. Picking comb for jet looms. 4,319,611, Cl. 139-435.000.
Ford Aerospace & Communications Corp.: *See—*
Rubin, Michael D.; and Ho, Pang T., 4,320,352, Cl. 330-277.000.
Fordath Limited: *See—*
Dumolo, David, 4,320,037, Cl. 523-142.000.
Forrester, Edward H.: *See—*
Rose, Steven A.; and Forrester, Edward H., 4,320,450, Cl. 364-200.000.
Fort, J. Robert, to United Geophysical Corporation. Digital geophone system. 4,320,472, Cl. 367-79.000.
Forty-Eight Insulations, Inc.: *See—*
Dejaiffe, Robert; and Kells, Edward L., 4,320,244, Cl. 13-6.000.
Foster, Arnold H. V. Refrigeration system for heat exchangers such as used in ice rinks and the like. 4,319,462, Cl. 62-235.000.
Fowler, William R.: *See—*
Balakrishnan, Ramanatha V.; and Fowler, William R., 4,320,521, Cl. 375-36.000.
Fox, Daniel W. Adjustable tree tie down. 4,319,428, Cl. 47-42.000.
Fradin, Maurice, to Chiron S.A. Process for preparing a minced meat product. 4,320,152, Cl. 426-618.000.
Framatome: *See—*
Coussau, Jean; and Brunaud, Daniel, 4,319,961, Cl. 376-260.000.
Frame, Robert R., to UOP Inc. Catalytic composite, method of manufacture, and process for use. 4,320,029, Cl. 252-428.000.
Frank, Howard L.: *See—*
Farazi, Perry; and Frank, Howard L., 4,320,506, Cl. 371-20.000.
Franke, Edward L., Jr.; Hartranft, George E.; and Patel, Amrutlal D., to Western Electric Company, Inc. Apparatus for corrugating a metal tape. 4,319,473, Cl. 72-196.000.
Frankiewicz, Theodore C., to Occidental Research Corporation. Process for converting oxygenated hydrocarbons into hydrocarbons. 4,320,241, Cl. 585-469.000.
Fransson, Arne S. B. Glass melt tanks. 4,319,909, Cl. 65-331.000.
Frawley, William J.; and Mongelluzzo, Philip A., to Schlumberger Technology Corporation. Well logging: depth correlation of logs. 4,320,469, Cl. 367-33.000.
Frazer, Robert E.: *See—*
United States of America, National Aeronautics and Space Administration; and Frazer, Robert E., 4,320,290, Cl. 250-216.000.
Frazier Industrial Company: *See—*
Clapp, Daniel W., 4,319,689, Cl. 211-182.000.
Fredrickson, Dennis L.: *See—*
Wulfsberg, Paul G.; Fredrickson, Dennis L.; Triplett, Gregory L.; Crumrine, Ralph J.; and Cunningham, Cole E., 4,320,357, Cl. 331-16.000.
Freed, Meier E.; and Diebold, James L., to American Home Products Corporation. Aryl—pyrrolo—thiazepin—diones and aryl—piperidino—thiazepin—diones. 4,320,057, Cl. 260-239.30B.
Freeman, Michael J. Verbally interactive telephone interrogation system with selectible variable decision tree. 4,320,256, Cl. 179-6.040.
Freers, Alan W.; and Pittenger, Daniel I., to Zenith Radio Corporation. Thermal coupler for amplifier temperature compensation. 4,320,349, Cl. 330-66.000.
Freiberg, Ashley H., to Stauffer Chemical Company. Animal systemic insecticide. 4,320,123, Cl. 424-203.000.
Freitag, Hans-Albrecht: *See—*
von Bonin, Wulf; Kleimann, Helmut; and Freitag, Hans-Albrecht, 4,320,067, Cl. 260-453.0AR.
Frenkel, Alexander D.: *See—*
Black, Malcolm H.; Frenkel, Alexander D.; and Roberts, Peter T., 4,320,142, Cl. 424-300.000.
Freude, Paul, to DIA-Nielsen GmbH Zubehor fur die Messtechnik. Writing device for recorders, measuring instruments and the like. 4,320,405, Cl. 346-140.00A.
Frey, Ernst; and Aregger, Alois, to Nahma AG. Apparatus for automatic repeated reproduction of sound on selected portions of magnetic tape or the like. 4,320,423, Cl. 360-72.200.
Freyberger, Wilfred L.: *See—*
Shaw, Donald L.; McGlothlin, Quentin T.; O'Brien, Barry M.; Keck, John W.; and Freyberger, Wilfred L., 4,319,987, Cl. 209-166.000.
Friedman, Harvey S.: *See—*
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Frischmann, Harald: *See—*
Motz, Herbert; Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Hartmann, Hans-Joerg; Frischmann, Harald; Falk, Roland; Hack, Joachim; Velic, Milan; and Kopke, Helmut, 4,320,171, Cl. 428-423.100.
Frito-Lay, Inc.: *See—*
Hilton, Barney W.; Lin, Robert I.; and Topor, Michael G., 4,320,009, Cl. 210-651.000.
Fritzlen, Jack D. Minimizing harmonic distortion apparatus. 4,320,398, Cl. 343-8.000.
Frye, Kenneth G., to Beloit Corporation. Continuous on machine ream cartoning. 4,319,442, Cl. 53-447.000.

Fuchs, Francis J., Jr., to Western Electric Company, Incorporated. Methods and apparatus for extrusion. 4,319,476, Cl. 72-272.000.
Fuji Electric Co., Ltd.: *See—*
Takezoe, Fumihiko, 4,320,508, Cl. 371-22.000.
Taniguchi, Harutaka; Hara, Kenichi; Shiraishi, Hideo; and Kiyofuji, Shinji, 4,320,378, Cl. 338-34.000.
Yamaki, Shoichi, 4,320,433, Cl. 361-45.000.
Fuji Kiko Kabushiki Kaisha: *See—*
Kawai, Takuro; and Kato, Mitsuru, 4,319,721, Cl. 242-107.40A.
Fuji Koeki Corporation: *See—*
Sawara, Kenji, 4,319,818, Cl. 354-145.000.
Fuji Photo Film Co., Ltd.: *See—*
Ishida, Masamitsu; Kato, Hisatoyo; and Matsumoto, Seiji, 4,320,296, Cl. 250-327.100.
Iwasa, Masakazu; Katou, Hisashi; and Honjo, Satoru, 4,320,408, Cl. 346-159.000.
Kozai, Katsuya; Makino, Teruyoshi; and Kikuchi, Hisashi, 4,320,187, Cl. 430-207.000.
Ogawa, Hiroshi; Nakahara, Hiromi; and Tamai, Yasuo, 4,320,159, Cl. 428-64.000.
Fuji Seiki Machine Works, Ltd.: *See—*
Suzuki, Shigenobu; Hayashi, Kooichi; Hayashi, Chiaki; Takagi, Toshiyuki; and Kobayashi, Shigeharu, 4,319,435, Cl. 51-421.000.
Fujii, Masaru; Kashiwara, Tomokazu; and Yamaguchi, Tetsuo, to Sumitomo Rubber Industries, Ltd. Cushioning fender assembly. 4,319,539, Cl. 114-219.000.
Fujikawa, Noboru: *See—*
Taguchi, Tadashi; Takemoto, Toshihide; Fujikawa, Noboru; and Kohno, Mitsuo, 4,320,189, Cl. 430-288.000.
Fujiki, Hirokazu: *See—*
Miyaji, Yoshimori; Fujiki, Hirokazu; and Takahashi, Fumio, 4,320,414, Cl. 358-51.000.
Fujimoto, Isao: *See—*
Ojima, Katsuhiro; Matsushita, Hajime; Fujimoto, Isao; Mizuno, Satosi; and Nishida, Tsuyoshi, 4,319,542, Cl. 118-100.000.
Fujita, Fumio; Kitamura, Shuji; Tamura, Toshifumi; and Nagase, Tsuneyuki, to Sumitomo Chemical Company, Limited. Method for preparing highly absorbent hydro-gel polymers. 4,320,040, Cl. 524-459.000.
Fujitani, Nobuyuki: *See—*
Ishii, Yoshiya; Fujitani, Nobuyuki; and Dohshita, Hidetoshi, 4,319,550, Cl. 123-198.0DB.
Fujitsu Limited: *See—*
Fukushima, Toshitaka, 4,320,411, Cl. 357-50.000.
Fukushima, Toshitaka; Koyama, Kazumi; and Ueno, Kouji, 4,320,507, Cl. 371-21.000.
Shuji, Takeshita, 4,319,845, Cl. 356-400.000.
Suzuki, Shinjiro; Yoshikawa, Tadashi; Otsuki, Tsuguo; Takeda, Masao; Kamoi, Nobuhisa; and Satoh, Kazuo, 4,320,348, Cl. 330-52.000.
Fukuda, David S.: *See—*
Abbott, Bernard J.; and Fukuda, David S., 4,320,052, Cl. 260-112.50R.
Abbott, Bernard J.; and Fukuda, David S., 4,320,053, Cl. 260-112.50R.
Abbott, Bernard J.; and Fukuda, David S., 4,320,054, Cl. 260-112.50R.
Fukuda, Kenji: *See—*
Oyabu, Mikio; Fukuda, Kenji; and Hirata, Keiichi, 4,320,107, Cl. 423-447.600.
Fukushima, Toshitaka, to Fujitsu Limited. Integrated circuit with double dielectric isolation walls. 4,320,411, Cl. 357-50.000.
Fukushima, Toshitaka; Koyama, Kazumi; and Ueno, Kouji, to Fujitsu Limited. Field programmable device having test provisions for fault detection. 4,320,507, Cl. 371-21.000.
Fukuzawa, Koji; and Kawaguchi, Hideo, to Oriental Motor Co., Ltd. Method of assembling rotor of stepping motor. 4,319,398, Cl. 29-598.000.
Fumakilla Limited: *See—*
Takei, Yasuharu; Kodama, Yasuharu; Shimoda, Hiroshi; and Ohi, Satoshi, 4,320,139, Cl. 424-282.000.
Funabashi, Shinichiro: *See—*
Hisazumi, Nobuyuki; Funabashi, Shinichiro; and Sugeno, Katsuhiko, 4,320,175, Cl. 428-518.000.
Furuya, Katusuke, to Laurel Bank Machine Co., Ltd. Currency handling machine. 4,319,597, Cl. 133-8.00A.
Fusaro, Louis V. Auto travel ski bag. 4,319,617, Cl. 150-52.00R.
G.D Societa per Azioni: *See—*
Seragnoli, Enzo, 4,319,861, Cl. 414-419.000.
GAF Corporation: *See—*
Parthasarathy, R.; and Hort, Eugene V., 4,320,031, Cl. 252-432.000.
Resnick, Bruce M., 4,320,144, Cl. 424-311.000.
Tu, Shu-Tung; and Lorenz, Donald H., 4,319,811, Cl. 351-166.000.
Gaillard, Jean: *See—*
Bellanger, Maurice G.; and Gaillard, Jean, 4,320,362, Cl. 333-165.000.
Chauvin, Yves; Gaillard, Jean; Leger, Gerard; and Van Landeghem, Hugo, 4,320,243, Cl. 585-521.000.
Gandolfi, Carmelo: *See—*
Pellegata, Renato; and Gandolfi, Carmelo, 4,320,143, Cl. 424-305.000.
Gann, Bonnie L. Needlework thread holder and organizer. 4,319,703, Cl. 223-106.000.
Garavaglia, Carlo: *See—*
Cecere, Mirella; Gozzo, Franco; Lorusso, Simone; and Garavaglia, Carlo, 4,320,132, Cl. 424-269.000.
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonova, Grigory V., deceased; by Samsonova, Nadezhda A., administrator; by Samsonova, Natalya G., administrator; and by Samsonova, Evgeny G., administrator. Apparatus for explosive application of coatings to articles. 4,319,715, Cl. 239-81.000.
Garland, Charles: *See—*
Latimer, John P.; and Garland, Charles, 4,319,414, Cl. 37-58.000.
Garrett Corporation, The: *See—*
Olivier, Paul D., 4,320,381, Cl. 340-52.00F.
Gas Research Institute: *See—*
Anderson, Gerald L.; Onischak, Michael; and Rush, William F., 4,319,891, Cl. 55-15.000.
Happel, John; and Hnatow, Miguel A., 4,320,030, Cl. 252-432.000.
Gatos, Harry C.; and Chi, Jim-Yong, to Massachusetts Institute of Technology. Solar cell having multiple p-n junctions and process for producing same. 4,320,247, Cl. 136-255.000.
Gaube, Johann: *See—*
Kaufhold, Manfred; and Gaube, Johann, 4,320,237, Cl. 568-909.000.
Gauger, Gary A.: *See—*
Lapp, John; Mason, Marco J.; Gauger, Gary A.; and Chai, Hui-Min, 4,320,034, Cl. 252-567.000.
Gavrielides, Athanasios: *See—*
Peterson, Phillip R.; Gavrielides, Athanasios; and Erkkila, John H., 4,320,359, Cl. 372-18.000.
Gaydon, Jean P.; and Haglon, Claude, to BBC Brown, Boveri & Company, Limited. Process and apparatus for arc control in arc furnaces. 4,320,245, Cl. 13-12.000.
Gebrueder Buehler AG: *See—*
Muller, Roman, 4,319,990, Cl. 209-240.000.
Geist, Bernard W.; and Novak, Raymond F., to Duo-Fast Corporation. Fastener driving tool. 4,319,705, Cl. 227-120.000.
Geiter, Robert: *See—*
Schwartz, Larry A.; Geiter, Robert; and Albertsen, Peter S., 4,319,556, Cl. 126-77.000.
Gelman Sciences, Inc.: *See—*
Vincent, Monty E.; and Vizulis, Karlis, 4,319,996, Cl. 210-188.000.
General Automation, Inc.: *See—*
Tanikawa, Roy K., 4,320,457, Cl. 364-200.000.
General Dynamics Corp./Electronics Division: *See—*
Bowen, Edwin D., 4,320,402, Cl. 343-700.0MS.
General Electric Company: *See—*
Anderson, Thomas E., 4,320,325, Cl. 315-205.000.
Brown, Robert E., 4,320,268, Cl. 200-5.00A.
Crivello, James V., 4,319,974, Cl. 204-159.110.
Davis, Richard K.; and Konrad, Charles E., 4,320,334, Cl. 320-48.000.
Harris, Raymond W., 4,320,386, Cl. 340-825.220.
Knemeyer, Friedel S., 4,319,707, Cl. 228-46.000.
Liu, Ping Y., 4,320,212, Cl. 525-148.000.
Mark, Victor; and Hedges, Charles V., 4,320,234, Cl. 568-724.000.
Minnear, William P.; and Morrison, William A., 4,320,079, Cl. 264-102.000.
Plunkett, Allan B., 4,320,331, Cl. 318-722.000.
Shaw, David G.; and Yializis, Angelo, 4,320,437, Cl. 361-303.000.
Stirk, Gary L., 4,320,434, Cl. 361-86.000.
Sugalski, Raymond K., 4,320,182, Cl. 429-94.000.
Wiley, Emmett H., 4,319,796, Cl. 339-65.000.
Wiley, Emmett H., 4,320,439, Cl. 362-3.000.
General Mills, Inc.: *See—*
Enger, Carl C., 4,319,578, Cl. 128-635.000.
General Motors Corporation: *See—*
Brandenburg, Darrell L., 4,319,806, Cl. 350-281.000.
Compeau, Edward E., deceased; and Winnale, James A., 4,319,769, Cl. 280-808.000.
Corteg, Walter V.; Gillies, Jack K.; and Sauer, Alfred B., 4,319,766, Cl. 280-511.000.
Hegler, Gary G.; and Westercamp, Kenneth L., 4,319,467, Cl. 64-32.00R.
Mann, Gamdur S., 4,319,453, Cl. 60-309.000.
Pearce, Warren, Jr., 4,319,799, Cl. 339-217.00R.
Schubert, Malvin L., 4,319,455, Cl. 60-547.00R.
Winchell, Frank J., 4,319,571, Cl. 128-283.000.
General Staple Company, Inc.: *See—*
Zahn, Irwin, 4,320,176, Cl. 428-573.000.
George, John A. Trigger mechanism for siphon apparatus. 4,319,601, Cl. 137-124.000.
Gernand, Martin O.: *See—*
Waghorne, Robert H.; Gernand, Martin O.; and Pafford, Bernie J., 4,319,892, Cl. 55-60.000.
Gestetner, Arthur. Container holder and method of packaging. 4,319,681, Cl. 206-45.190.
Gewerkschaft Eisenhutte Westfalia: *See—*
Weirich, Walter; and Hennlich, Gunter, 4,319,772, Cl. 285-26.000.
Gibson, Van A. Protective cage for excavation workers. 4,319,791, Cl. 312-239.000.
Gille, Gunther; Goertler, Horst; and Prohaska, Hans, to ITT Industries, Inc. Windshield wiper control circuit. 4,320,329, Cl. 318-443.000.
Gilleland, Randall C.: *See—*
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,320,278, Cl. 219-69.00G.
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,320,279, Cl. 219-69.00P.
Gillery, F. Howard, to PPG Industries, Inc. Method for coating an article to alternately reflect and absorb solar energy. 4,320,155, Cl. 427-160.000.

Gillies, Jack K.: *See—*
Corteg, Walter V.; Gillies, Jack K.; and Sauer, Alfred B., 4,319,766, Cl. 280-511.000.

Giovinazzo, Giovanni; and Varrone, Piergiorgio, to Centro Ricerche Fiat S.p.A. Transducer with six degrees of freedom. 4,320,392, Cl. 340-365.00C.

Gist-Brocades N.V.: *See—*
Bijlenga, Gosse, 4,320,115, Cl. 424-84.000.
Bull, Frederick G., 4,320,194, Cl. 435-7.000.

Gitlin, Richard D., to Bell Telephone Laboratories, Incorporated. Adaptive phase-jitter tracker. 4,320,526, Cl. 375-118.000.

GK Technologies, Incorporated: *See—*
Korbelak, Kenneth N.; and Masterson, Joseph B., 4,319,951, Cl. 156-502.000.

GKJ, Inc.: *See—*
Marr, Andrew W., Jr., 4,319,632, Cl. 166-60.000.

GKN Sankey Limited: *See—*
Golding, Cyril G., 4,319,612, Cl. 141-1.000.

Glass, Jeremy M., to Raytheon Company. Method and apparatus of bus arbitration using comparison of composite signals with device signals to determine device priority. 4,320,467, Cl. 364-900.000.

Gloanec, Maurice; and Castagne, Rene, to Thomson-CSF. Gunn-effect device modulatable by coded pulses, and a parallel-series digital converter using said device. 4,320,313, Cl. 307-243.000.

Gobran, Riad H.; Takahashi, Akio; and Reilly, Eugene P., to American Can Company. Ligno-novolak resin molding compositions. 4,320,036, Cl. 524-14.000.

Godard, Dominique N.; and Quintin, Michel Y., to International Business Machines Corp. Method and device for effecting the initial adjustment of the clock in a synchronous data receiver. 4,320,517, Cl. 375-13.000.

Godfrey, Roger D., to Flashstar Limited. Load carrying platforms. 4,319,732, Cl. 248-346.000.

Godwin, Charles L.: *See—*
White, Jack R.; Godwin, Charles L.; and Blattel, Raymond J., 4,320,289, Cl. 250-214.00R.

Goertler, Horst: *See—*
Gille, Gunther; Goertler, Horst; and Prohaska, Hans, 4,320,329, Cl. 318-443.000.

Gokce, Ata: *See—*
Wolf, Walter; Nakamura, Robert M.; Gokce, Ata; Tubis, Manuel; and O'Brien, Timothy J., 4,320,109, Cl. 424-1.000.

Gold, Marvin H.; and Winkler, Joseph. Denaturants for ethyl alcohol. 4,319,886, Cl. 44-53.000.

Goldfarb, Adolph E.; and Middleton, Nancy D., to Goldfarb, Adolph E. Play house apparatus. 4,319,424, Cl. 46-12.000.

Golding, Cyril G., to GKN Sankey Limited. Method of washing and filling containers. 4,319,612, Cl. 141-1.000.

Goldis, Alexander; Sellen, Kenneth R.; and Banka, Eugene F., to Burroughs Corporation. Fluid pump system for an ink jet printer. 4,320,407, Cl. 346-140.00R.

Good, Dallis L.; and Good, David L., to Metal Extraction Processes Corporation. Method and means for recovering silver by electrolysis. 4,319,971, Cl. 204-109.000.

Good, David L.: *See—*
Good, Dallis L.; and Good, David L., 4,319,971, Cl. 204-109.000.

Gooden, Richmond A.: *See—*
Hronek, George; and Gooden, Richmond A., 4,319,630, Cl. 165-70.000.

Goodyear Tire & Rubber Company, The: *See—*
Knill, Robert B., 4,319,620, Cl. 152-209.00R.

Gorchev, Dimiter; Ingard, Karl U.; and Willke, Herbert L., Jr., to Mitco Corporation. Air distribution system. 4,319,521, Cl. 98-38.00E.

Gormley, James J.: *See—*
Dutta, Anand S.; Gormley, James J.; Hayward, Christopher F.; Morley, John S.; and Stacey, Gilbert J., 4,320,117, Cl. 424-177.000.

Gornall, William S., to Burleigh Instruments, Inc. Interferometer apparatus for the direct measurement of wavelength and frequency. 4,319,843, Cl. 356-346.000.

Gorog, Peter: *See—*
Benko, Pal; Messmer, Andras; Hajos, Gyorgy; Batori, Sandor; Petocz, Lujza; Kosoczky, Iboly; and Gorog, Peter, 4,320,127, Cl. 424-249.000.

Goschke, Richard: *See—*
Bernasconi, Raymond; Ferrini, Pier G.; Goschke, Richard; and Gosteli, Jacques, 4,320,138, Cl. 424-275.000.

Gosteli, Jacques: *See—*
Bernasconi, Raymond; Ferrini, Pier G.; Goschke, Richard; and Gosteli, Jacques, 4,320,138, Cl. 424-275.000.

Gozzo, Franco: *See—*
Cecere, Mirella; Gozzo, Franco; Lorusso, Simone; and Garavaglia, Carlo, 4,320,132, Cl. 424-269.000.

Grabiak, Raymond C.; and Miles, James A., to Monsanto Company. Substituted benzazaphospholes, herbicidal compositions and the use thereof. 4,319,913, Cl. 71-86.000.

Grabmaier, Josef, to Siemens Aktiengesellschaft. Method for producing disc or band-shaped Si crystals with columnar structure for solar cells. 4,319,953, Cl. 156-608.000.

Graf, Rudolf; and Sturzenegger, Christian, to Sprecher & Schuh AG. Gas-blast switch. 4,320,270, Cl. 200-148.00A.

Graham, Martin H., to Rolm Corporation. Transmitter/receiver for use on common cable communications system such as ethernet. 4,320,520, Cl. 375-36.000.

Gram, Anker, to Cleanair Combustion Systems Ltd. Liquefactor. 4,319,900, Cl. 62-42.000.

Granda, Edward J.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Granda, Edward J.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,319,586, Cl. 131-276.000.

Grane, Christian, to Hesse, Ruth Lea. Tracheal suction pump designed primarily for aspiration purposes. 4,319,570, Cl. 128-278.000.

Grechishkin, Evgeny F.: *See—*
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonova, Grigory V., deceased; Samsonova, Nadezhda A., administrator; Samsonova, Natalya G., administrator; and Samsonova, Evgeny G., administrator, 4,319,715, Cl. 239-81.000.

Greene, Paul E.: *See—*
Burmeister, Robert A.; Greene, Paul E.; and Hiskes, Ronald, 4,319,803, Cl. 350-96.330.

Greenwood, Terence L., to Standard Oil Company (Indiana). Expandable sealing compositions. 4,320,076, Cl. 264-35.000.

Gregersen, Johan C.: *See—*
Christoffersen, Sten R.; Gregersen, Johan C.; and Larsen, Mogens B., 4,319,491, Cl. 73-662.000.

Greve, James E.; and Zdanys, John, Jr., to CTS Corporation. Multiple-function switch with automatic return. 4,320,267, Cl. 200-4.000.

Griffiths, Charles R.; and Ferguson, William G., to GTE Products Corporation. Oscillatory circuit utilizing PTC resistor. 4,320,309, Cl. 307-132.00T.

Groeneveld, Wilbur E.: *See—*
Arnold, John; Groeneveld, Wilbur E.; and Heckley, Warner, 4,319,446, Cl. 56-341.000.

Gronbech, Robert W., to Davy-Loewy Limited. Rolling method and apparatus. 4,319,474, Cl. 72-229.000.

Gross, Friedrich; Meise, Guenther; and Unger, Herbert, to WABCO Fahrzeugbremsen GmbH. Hydro-pneumatic brake cylinder device for motor vehicle brake systems. 4,319,457, Cl. 60-593.000.

Grossman, James M.; and January, Daniel B., to Hunter Engineering Company. Vehicle wheel alignment apparatus. 4,319,838, Cl. 356-152.000.

Grotnes Metalforming Systems, Inc.: *See—*
Fencl, Vernon R., 4,320,327, Cl. 318-50.000.

Groult, Alain: *See—*
Porta, Augusto; Kulhanek, Antonin; Groult, Alain; and Tourrier, Herve ', 4,319,973, Cl. 204-133.000.

Grove, Louise A., administratrix: *See—*
Grove, William S., deceased, 4,319,917, Cl. 71-105.000.

Grove, William S., deceased (by Grove, Louise A., administratrix), to PPG Industries, Inc. N-(2-Cyanoalkoxy)methyl-N-(2-,3-, or 6-alkylphenyl)-α-haloacetamides. 4,319,917, Cl. 71-105.000.

Gruber, Bruce A.; Langer, Heimo J.; and Dunnavant, William R., to Ashland Oil, Inc. Binder composition. 4,320,218, Cl. 526-308.000.

Grudkowski, Thomas W.: *See—*
Black, James F.; Courtney, Richard A.; Grudkowski, Thomas W.; Norusis, Philip T.; and Wood, Harry R., 4,320,365, Cl. 333-187.000.

Gruesbeck, Thomas L., to Libbey-Owens-Ford Company. Granular material trap. 4,319,999, Cl. 210-95.000.

GSE, Inc.: *See—*
Marcinkiewicz, Eugene J., 4,319,494, Cl. 73-862.230.

GTE Products Corporation: *See—*
Brower, Boyd G.; and Shaffer, John W., 4,320,440, Cl. 362-13.000.
Griffiths, Charles R.; and Ferguson, William G., 4,320,309, Cl. 307-132.00T.
Oakes, James J.; and Scheithauer, William, Jr., 4,320,156, Cl. 427-213.000.
Rothwell, Harold L., Jr.; Keeffe, William M.; and Gungle, W. Calvin, 4,320,322, Cl. 313-217.000.

Guarracini, Joseph; and Ruggeri, Vincent J., to RCA Corporation. Video disc stylus control apparatus. 4,320,487, Cl. 369-43.000.

Guertin, Joseph R. Weigh scale. 4,319,652, Cl. 177-255.000.

Guhne, Wieland: *See—*
Simm, Hans-Peter; Guhne, Wieland; and Schlecht, Annegret, 4,319,380, Cl. 15-410.000.

Guiley, Clifford D., Jr.: *See—*
Murphy, Walter T.; and Guiley, Clifford D., Jr., 4,320,047, Cl. 523-457.000.

Gulf Oil Corporation: *See—*
Acharya, Vikramkumar; and Lakshmanan, Pallavoor R., 4,320,211, Cl. 525-126.000.
Havens, Richard H., 4,320,046, Cl. 524-83.000.
Kim, Jin K.; Murphy, Clarence R.; and Smith, Edward W., 4,320,210, Cl. 525-57.000.

Gulf Plastic Fabricated Products Company: *See—*
Pope, Carl M., 4,319,944, Cl. 156-195.000.

Gulf Research & Development Corp.: *See—*
Schulz, Johann G.; Barie, Walter P., Jr.; and Eurich, James T., 4,320,223, Cl. 527-501.000.

Gullett, Elmer G., to PPG Industries, Inc. Method and apparatus for guiding glass batch in a glass melting furnace. 4,319,904, Cl. 65-27.000.

Gundlach, Roy L. Litter free protective beverage can lid. 4,319,692, Cl. 220-268.000.

Gungle, W. Calvin: *See—*
Rothwell, Harold L., Jr.; Keeffe, William M.; and Gungle, W. Calvin, 4,320,322, Cl. 313-217.000.

Gupta, Anita M.: *See—*
Brady, Douglas M.; and Gupta, Anita M., 4,320,535, Cl. 455-278.000.

Gupta, Mohinder K.: *See*—
Champaneria, Ashok J.; and Gupta, Mohinder K., 4,319,388, Cl. 28-257.000.
Guretzky, Harold. Angle-position transducer. 4,320,293, Cl. 250-231.05E.
Gurske, William A., to Beckman Instruments, Inc. Electrophoretic technique for separating serum proteins and improved electrophoretic gel for use therein. 4,319,976, Cl. 204-180.00G.
Gursky, Michael T.; and Pcihoda, William W., to Western Electric Co., Inc. Adjusting successive steps for making carrier tape. 4,320,192, Cl. 430-323.000.
Gussow, Christopher H., to Hunter Douglas, Inc. Method of finishing the exterior wall of a prefabricated building and trim therefor. 4,319,439, Cl. 52-288.000.
Gustafsson, Bror, to Handelsbolaget Zeidler Holmgren. Storage device for bodies, which shall be exposed to the environment such as bodies for the absorption of humidity. 4,319,679, Cl. 206-0.500.
Gutridge, Jack E.; and Nagy, Ernest J., to Pullman Incorporated. Railway passenger car interior paneling and finish assembly. 4,319,528, Cl. 105-397.000.
Guzikov, Sergei D.: *See*—
Bank, Mikhail U.; Prozorov, Valery I.; Rubichev, Nikolai A.; Odnolko, Mikhail V.; Rozenberg, Evgeny A.; Bessonov, Alexei F.; Berezjuk, Iraida K.; and Guzikov, Sergei D., 4,320,532, Cl. 455-226.000.
Haase, Wayne C.; and Thompson, Dale J., to Thompson, Dale J. Baro data indicator. 4,319,487, Cl. 73-384.000.
Habich, Andreas; and Arnold, Josef, to Robert Bosch GmbH. Nongassing storage battery. 4,320,181, Cl. 429-59.000.
Hack, Joachim: *See*—
Motz, Herbert; Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Hartmann, Hans-Joerg; Frischmann, Harald; Falk, Roland; Hack, Joachim; Velic, Milan; and Kopke, Helmut, 4,320,171, Cl. 428-423.100.
Hackman, Kenneth V., to Southwest Products Co. Means and techniques useful in mounting self-aligning bearings. 4,319,788, Cl. 308-72.000.
Hackney, John. Sailcraft traveler car and assembly. 4,319,537, Cl. 114-112.000.
Haglon, Claude: *See*—
Gaydon, Jean P.; and Haglon, Claude, 4,320,245, Cl. 13-12.000.
Haight, William J., to Mineral Recovery Corporation. Process and apparatus for separating particles by relative density. 4,319,995, Cl. 209-481.000.
Hajos, Gyorgy: *See*—
Benko, Pal; Messmer, Andras; Hajos, Gyorgy; Batori, Sandor; Petocz, Lujza; Kosoczky, Iboly; and Gorog, Peter, 4,320,127, Cl. 424-249.000.
Halbach & Braun: *See*—
Braun, Ernst; and Braun, Gert, 4,319,783, Cl. 299-43.000.
Halbritter, Klaus: *See*—
Kropp, Rudolf; Fischer, Martin; and Halbritter, Klaus, 4,320,062, Cl. 260-343.600.
Hall, Robert C., to Memorex Mini Disc Drive Corporation. Centering and mounting apparatus for a magnetic recording disc. 4,320,425, Cl. 360-97.000.
Hall, Roy L. Solar heating system. 4,319,560, Cl. 126-450.000.
Halliburton Services: *See*—
Baker, Eugene E.; and Carter, Ernest E., Jr., 4,319,638, Cl. 166-355.000.
McMahan, Michael E.; Jackson, Gerald D.; and Barrington, Burchus Q., 4,319,633, Cl. 166-250.000.
McMahan, Michael E.; and Barrington, Burchus Q., 4,319,634, Cl. 166-250.000.
Halomet, Incorporated: *See*—
Aldrich, Robert G., 4,319,988, Cl. 209-172.500.
Halstead, Donald B. Percussion tool. 4,319,706, Cl. 227-126.000.
Hamberger, Helmut; Stutz, Peter; Scholz, Dieter; and Fliri, Hans, to Sandoz Ltd. Penicillins and their antibacterial use. 4,320,133, Cl. 424-269.000.
Hament, Erwin. Cup lid. 4,319,691, Cl. 220-90.400.
Hanafin, Joseph W.: *See*—
Reierson, Robert L.; Bremmer, Bart J.; and Hanafin, Joseph W., 4,320,024, Cl. 252-78.300.
Handelsbolaget Zeidler Holmgren: *See*—
Gustafsson, Bror, 4,319,679, Cl. 206-0.500.
Hanma, Kentaro; and Yanagawa, Kaoru, to Hitachi, Ltd. Automatic focusing system for video camera. 4,320,417, Cl. 358-227.000.
Hann, Paul D.: *See*—
Makovec, Donald J.; and Hann, Paul D., 4,320,233, Cl. 568-697.000.
Hanna, Nabil S.; and Shuey, John R., to AMP Incorporated. Locking spring clip. 4,319,733, Cl. 248-507.000.
Hannett, William J.; and Brendel, Thomas E., to Carrier Corporation. Refrigeration machine and a method of charging the same. 4,319,459, Cl. 62-77.000.
Hansen, Rainer: *See*—
Benteler, Hubertus; Hansen, Rainer; Olszewski, Egon; and Wecker, Ferdinand, 4,319,471, Cl. 72-59.000.
Happel, John; and Hnatow, Miguel A., to Gas Research Institute. Process for making high activity transition metal catalysts. 4,320,030, Cl. 252-432.000.
Haque, Yusuf A., to American Microsystems, Inc. Switched capacitor comparator. 4,320,347, Cl. 330-9.000.
Hara, Kenichi: *See*—
Taniguchi, Harutaka; Hara, Kenichi; Shiraishi, Hideo; and Kiyofuji, Shinji, 4,320,378, Cl. 338-34.000.
Harayama, Hiroshi; Shinkai, Ken; Takahashi, Hiroshi; and Mizusako, Masahiro, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Method of making silane-modified ethylene-type resin. 4,320,214, Cl. 525-264.000.
Harmuth, Charles M., to Du Pont de Nemours, E. I., and Company. Melt-blending method of forming pigmented powder coatings. 4,320,048, Cl. 523-333.000.
Harris Corporation: *See*—
Burton, Willie T., Jr., 4,320,515, Cl. 375-4.000.
Hayes, David F., 4,320,522, Cl. 375-48.000.
Harris, Raymond W., to General Electric Company. Selection and power reset circuit. 4,320,386, Cl. 340-825.220.
Harrison, John R., to American Standard Inc. Fail-safe band-pass circuit. 4,320,354, Cl. 330-306.000.
Harrold, Ronald T., to Westinghouse Electric Corp. Dielectric gas-vapor and vapor-vapor mixtures. 4,320,035, Cl. 252-574.000.
Hart, Thomas G., to Energy Development Associates, Inc. Transference and purification of halogen and hydrohalic acid in an electrochemical system. 4,320,179, Cl. 429-15.000.
Hartig, R. George: *See*—
Palm, Gordon F.; and Hartig, R. George, 4,320,012, Cl. 210-713.000.
Hartmann, Hans; and Mauthe, Gerhard, to BBC Brown, Boveri & Company, Ltd. Combined current and voltage converter for a compressed-gas insulated metal-enclosed high voltage installation. 4,320,337, Cl. 323-358.000.
Hartmann, Hans-Joerg: *See*—
Motz, Herbert; Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Hartmann, Hans-Joerg; Frischmann, Harald; Falk, Roland; Hack, Joachim; Velic, Milan; and Kopke, Helmut, 4,320,171, Cl. 428-423.100.
Hartmann, Heinrich: *See*—
Motz, Herbert; Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Hartmann, Hans-Joerg; Frischmann, Harald; Falk, Roland; Hack, Joachim; Velic, Milan; and Kopke, Helmut, 4,320,171, Cl. 428-423.100.
Hartmann, Henry, Jr., to United States of America, Army. Multiple wedge element lens for an ultrasonic inspection transducer. 4,319,490, Cl. 73-642.000.
Hartranft, George E.: *See*—
Franke, Edward L., Jr.; Hartranft, George E.; and Patel, Amrutlal D., 4,319,473, Cl. 72-196.000.
Hasbro Industries, Inc.: *See*—
Fogarty, Bonnie R.; and Fogarty, A. Edward, 4,319,532, Cl. 112-79.500.
Hase, Alfred M. Battery charger and surveillance system. 4,320,333, Cl. 320-43.000.
Hashima, Akio. Frequency stabilized downconverter facilitating output frequency alteration. 4,320,533, Cl. 455-259.000.
Hashimoto, Nobuyuki; and Satomoto, Atsushi, to Aisin Seiki Kabushiki Kaisha. Filter cap. 4,319,693, Cl. 220-373.000.
Hashimoto, Susumu: *See*—
Otani, Shuichi; Kato, Shinichi; Hashimoto, Susumu; and Itoh, Kyohichi, 4,319,797, Cl. 339-75.00R.
Hashimoto, Teiji, to Canon Kabushiki Kaisha. Electromagnetic driving device. 4,319,823, Cl. 354-234.000.
Hashimoto, Yohei; Ogura, Masaru; and Ishizone, Hiroyuki, to Yamasu Shoyu Kabushiki Kaisha; and Hashimoto, Yohei. Periandrins extracted from plants of the genus Periandra. 4,320,225, Cl. 536-4.000.
Haskell, Barin G., to Bell Telephone Laboratories, Incorporated. Spread spectrum FH-MFSK radio receiver. 4,320,514, Cl. 375-1.000.
Hatch, Walter H.; Balinsky, George J.; and Ackerman, Steve, to Exxon Research & Engineering Co. Magnetically stabilized bed, temperature, partial pressure swing, hydrogen recovery process. 4,319,893, Cl. 55-60.000.
Hatfield, Ronald D.: *See*—
Thissen, Christopher P.; Ferwerda, Jerry J.; Tweet, Milford J.; and Hatfield, Ronald D., 4,319,949, Cl. 156-446.000.
Hattori, Hiroyuki: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,319,828, Cl. 355-3.00R.
Hattori, Tadashi: *See*—
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,319,480, Cl. 73-35.000.
Haub, Martin: *See*—
Collonia, Harald; Mann, Arnold; and Haub, Martin, 4,319,658, Cl. 180-271.000.
Hausler, Michael; and Sadex, Kadry, to Brown, Boveri & Cie AG. Control of a HVT (high voltage D-C transmission) short coupler. 4,320,444, Cl. 363-35.000.
Havens, Richard H., to Gulf Oil Corporation. Method for coloring olefin polymers. 4,320,046, Cl. 524-83.000.
Hayashi, Chiaki: *See*—
Suzuki, Shigenobu; Hayashi, Kooichi; Hayashi, Chiaki; Takagi, Toshiyuki; and Kobayashi, Shigeharu, 4,319,435, Cl. 51-421.000.
Hayashi, Katsumi, to Lubrizol Corporation, The. Multi-purpose additive compositions and concentrates containing same. 4,320,019, Cl. 252-51.50A.
Hayashi, Koji: *See*—
Mitsuhashi, Hiroshi; Mizuno, Den-ichi; Hayashi, Koji; Abe, Shigeru; Takase, Muneaki; and Narita, Toshiharu, 4,320,120, Cl. 424-182.000.
Mizuno, Den-ichi; Mitsuhashi, Hiroshi; Abe, Shigeru; and Hayashi, Koji, 4,320,119, Cl. 424-182.000.

Hayashi, Kooichi: *See—*
Suzuki, Shigenobu; Hayashi, Kooichi; Hayashi, Chiaki; Takagi, Toshiyuki; and Kobayashi, Shigeharu, 4,319,435, Cl. 51-421.000.

Hayashi, Masayuki: *See—*
Sakamoto, Koji; Hayashi, Masayuki; Koizumi, Yutaka; and Tanzawa, Misao, 4,319,832, Cl. 355-15.000.

Hayes, David F., to Harris Corporation. Programmable frequency and signalling format tone frequency encoder/decoder circuit. 4,320,522, Cl. 375-48.000.

Hayward, Christopher F.: *See—*
Dutta, Anand S.; Gormley, James J.; Hayward, Christopher F.; Morley, John S.; and Stacey, Gilbert J., 4,320,117, Cl. 424-177.000.

Hayward, John; and Douwens, Robert. Method and apparatus for inhalation rewarming. 4,319,566, Cl. 128-203.260.

Hazeltine Corporation: *See—*
Thomas, Robert M., 4,320,360, Cl. 331-172.000.

Healey, Daniel J., III, to United States of America, Air Force. Large dynamic range low distortion amplitude modulation detector apparatus. 4,320,346, Cl. 329-101.000.

Hebert, Gayle P.: *See—*
Zoleski, Benjamin H.; Hebert, Gayle P.; Sung, Rodney L.; and Scarberry, Robert M., 4,320,016, Cl. 252-42.700.

Heckelman, James D.; and Hickey, William P. Compartment locking means and thermal actuator therefor. 4,319,659, Cl. 180-271.000.

Heckley, Warner: *See—*
Arnold, John; Groeneveld, Wilbur E.; and Heckley, Warner, 4,319,446, Cl. 56-341.000.

Hedges, Charles V.: *See—*
Mark, Victor; and Hedges, Charles V., 4,320,234, Cl. 568-724.000.

Hedgewick, Peter: *See—*
Birrell, Stewart H.; and Hedgewick, Peter, 4,319,690, Cl. 215-220.000.

Hegler, Gary G.; and Westercamp, Kenneth L., to General Motors Corporation. Universal joint seal vent. 4,319,467, Cl. 64-32.00R.

Heidmann, Richard; and Thieck, Jacques P., to Societe Europeenne de Propulsion. Gasdynamic lasers. 4,320,358, Cl. 372-90.000.

Heilhecker, Joe K.; and Schoeneman, David D., to Brandt Company, The. Dryer system for drilling mud cuttings. 4,319,410, Cl. 34-75.000.

Heinemann, Henning: *See—*
Ohlendorf, Heinrich-Wilhelm; Wolf, Klaus-Ullrich; Kaupmann, Wilhelm; and Heinemann, Henning, 4,320,061, Cl. 260-333.000.

Heinz, Gerhard; Richter, Peter; and Jun, Mong-Jon, to BASF Aktiengesellschaft. Photopolymerizable compositions containing elastomers and photo-curable elements made therefrom. 4,320,188, Cl. 430-281.000.

Heinzerling, Jurgen, to U.S. Philips Corporation. Magnet coil arrangement for generating linear magnetic gradient fields. 4,320,342, Cl. 324-319.000.

Heinzl, Joachim, to Siemens Aktiengesellschaft. Ink printing device for multi-colored printing of a recording medium. 4,320,406, Cl. 346-140.00R.

Heise, Nyles N.; Hoffman, Roy L.; Kiss, Istvan S.; Lewis, David O.; Pertzborn, James J.; and Robinson, Thomas S., to International Business Machines Corporation. Control apparatus for virtual address translation unit. 4,320,456, Cl. 364-200.000.

Heisler, Robert W.: *See—*
Sznopek, John L.; Lostak, Charles; Heisler, Robert W.; Ferraro, Joseph P.; and Kazienko, Henry J., 4,319,950, Cl. 156-475.000.

Heitz, James R.: *See—*
Crounse, Nathan N.; and Heitz, James R., 4,320,140, Cl. 424-283.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Hill, Frank; Preuss, Wolfgang; Schindler, Joachim; Schmid, Rolf; and Struve, Alfred, 4,320,195, Cl. 435-55.000.

Henning, Gary S., to Snap-on Tools Corporation. Method of forming tools from alloy steel for severe cold forming. 4,319,934, Cl. 148-12.00F.

Hennlich, Gunter: *See—*
Weirich, Walter; and Hennlich, Gunter, 4,319,772, Cl. 285-26.000.

Henrekson, Ulf A.: *See—*
Backman, Erik E.; Henrekson, Ulf A.; and Nertman, Inge L., 4,319,684, Cl. 206-464.000.

Henry, David W.; and Mathews, Herbert H., to Coburn Optical Industries, Inc. Method and apparatus for aligning an ophthalmic lens during a blocking operation. 4,319,846, Cl. 356-401.000.

Hensel, Paul C., to Post Office, The. Joining optical fiber end parts. 4,319,902, Cl. 65-4.210.

Hentschel, Bernhard; Ziebarth, Jurgen; Coenen, Alfred; Kosswig, Kurt; and Praun, Ferdinand V., to Chemische Werke Huls AG. Method for preparing sodium bicarbonate and hydrogen chloride. 4,320,106, Cl. 423-424.000.

Herculite Protective Fabrics Corporation: *See—*
Kydonieus, Agis F., 4,320,113, Cl. 424-27.000.

Hermann, Wilhelm; and Horster, Horst, to U.S. Philips Corporation. Solar collector for heating a gaseous heat transport medium. 4,319,559, Cl. 126-442.000.

Herrle, Karl: *See—*
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Hesler, Andrew B., to Farmstead Industries, Division of Farmhand, Inc. Manure conveying scraper apparatus. 4,319,678, Cl. 198-746.000.

Hesse, Ruth Lea: *See—*
Grane, Christian, 4,319,570, Cl. 128-278.000.

Hester Industries, Inc.: *See—*
Williams, Charles E., 4,319,460, Cl. 62-78.000.

Hewlett-Packard Company: *See—*
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Walker, Laurence G.; Sansbury, James D.; Rung, Jr.; and Manoliu, Juliana, 4,320,312, Cl. 307-238.800.

Hewson, John E.; and Schomer, Marion L., to Anderson, Greenwood & Co. Pressure transmitter manifold. 4,319,492, Cl. 73-756.000.

Heymer, Gero: *See—*
Wolter, Manfred; and Heymer, Gero, 4,320,108, Cl. 423-461.000.

Hibbard, William M., to His Way. Gold concentrator. 4,319,985, Cl. 209-3.000.

Hickam, William M.: *See—*
Carlson, Gerald L.; and Hickam, William M., 4,319,966, Cl. 204-1.00T.

Hickey, William P.: *See—*
Heckelman, James D.; and Hickey, William P., 4,319,659, Cl. 180-271.000.

Hidding, Gerhard, to Oce-Nederland B.V. Original feed system for copying machine. 4,319,833, Cl. 355-23.000.

Hiemstra, Christiaan K., to Hiemstra Evolux B.V. Packaging. 4,319,680, Cl. 206-45.140.

Hiemstra Evolux B.V.: *See—*
Hiemstra, Christiaan K., 4,319,680, Cl. 206-45.140.

Higashide, Eiji; Asai, Mitsuko; and Tanida, Seiichi, to Takeda Chemical Industries, Ltd. Antibiotic. 4,320,200, Cl. 435-253.000.

Higuchi, Masahiro: *See—*
Morishita, Sadao; Okumura, Fumio; Higuchi, Masahiro; Miyauchi, Masahiro; and Kamei, Syun, 4,320,039, Cl. 525-54.420.

Hill, Frank; Preuss, Wolfgang; Schindler, Joachim; Schmid, Rolf; and Struve, Alfred, to Henkel Kommanditgesellschaft auf Aktien. Steroid production. 4,320,195, Cl. 435-55.000.

Hill, Joseph L.: *See—*
Jones, Lonnie R.; and Hill, Joseph L., 4,320,112, Cl. 424-19.000.

Hillebrecht, Wayne R.; and Calderoni, Felice J., to Stauffer Chemical Company. Phosphonate herbicidal antidotes. 4,319,912, Cl. 71-86.000.

Hilton, Barney W.; Lin, Robert I.; and Topor, Michael G., to Frito-Lay, Inc. Processed anthocyanin pigment extracts. 4,320,009, Cl. 210-651.000.

Himmelstein, Sydney, to S. Himmelstein and Company. Production control system. 4,320,463, Cl. 364-552.000.

Hintsch, Otto: *See—*
Lehn, Rudolf; and Hintsch, Otto, 4,319,469, Cl. 66-207.000.

Hirabayashi, Kiyoteru: *See—*
Taira, Tadaaki; Hirabayashi, Kiyoteru; Ichinose, Hiroyuki; Hirano, Osamu; and Suzuki, Motoaki, 4,320,277, Cl. 219-61.000.

Hirai, Masaru: *See—*
Kozima, Masatoshi; Tokieda, Akinori; Nagumo, Tadanobu; and Hirai, Masaru, 4,319,619, Cl. 152-209.00R.

Hirano, Masachika: *See—*
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Hirano, Osamu: *See—*
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Hirata, Keiichi: *See—*
Oyabu, Mikio; Fukuda, Kenji; and Hirata, Keiichi, 4,320,107, Cl. 423-447.600.

Hirohata, Michio: *See—*
Tezuka, Nobuo; and Hirohata, Michio, 4,319,821, Cl. 354-230.000.
Tezuka, Nobuo; and Hirohata, Michio, 4,319,822, Cl. 354-234.000.

Hirsch, Michael A.; Irvine, Douglas S.; and Krupey, John, to American Home Products Corporation. Immunologic compositions methods of preparation and use. 4,320,111, Cl. 424-12.000.

Hirsch, Thomas S.: *See—*
Woods, William E.; Stanley, Philip E.; and Hirsch, Thomas S., 4,320,455, Cl. 364-200.000.

His Way: *See—*
Hibbard, William M., 4,319,985, Cl. 209-3.000.

Hisaki, Tomoko: *See—*
Yoshikawa, Akira; Ochi, Osamu; Hisaki, Tomoko; and Mizushima, Yoshihiko, 4,320,191, Cl. 430-296.000.

Hisazumi, Nobuyuki; Funabashi, Shinichiro; and Sugeno, Katsuhiko, to Kureha Kagaku Kogyo Kabushiki Kaisha. Laminated film. 4,320,175, Cl. 428-518.000.

Hisazumi, Yosinori: *See—*
Ooka, Isami; and Hisazumi, Yosinori, 4,320,303, Cl. 290-1.00R.

Hiskes, Ronald: *See—*
Burmeister, Robert A.; Greene, Paul E.; and Hiskes, Ronald, 4,319,803, Cl. 350-96.330.

Hitachi, Ltd.: *See—*
Hanma, Kentaro; and Yanagawa, Kaoru, 4,320,417, Cl. 358-227.000.
Komuro, Katsu; Hokari, Sadao; and Maeda, Yasuyuki, 4,319,665, Cl. 187-29.00R.
Otake, Yukio; Kikuchi, Yuji; Nakanishi, Tsuneo; and Miyakozawa, Keiji, 4,319,505, Cl. 83-295.000.
Takasaki, Yoshitaka, 4,320,527, Cl. 375-119.000.
Takeuchi, Takashi; Kaneko, Yoichi; and Owatari, Hisato, 4,320,276, Cl. 219-10.810.
Tanabe, Masanori; Shimada, Satoshi; Yasukawa, Akio; Nemoto, Hideyuki; Nishihara, Motohisa; Tsuchiya, Masatoshi; and Soeno, Ko, 4,319,397, Cl. 29-589.000.

Hitachi Metals, Ltd.: *See—*
Kondo, Takajiro; and Asamoto, Toshitaka, 4,319,507, Cl. 83-694.000.

Hnatow, Miguel A.: *See*—
Happel, John; and Hnatow, Miguel A., 4,320,030, Cl. 252-432.000.
Ho, Pang T.: *See*—
Rubin, Michael D.; and Ho, Pang T., 4,320,352, Cl. 330-277.000.
Hobbs, Larry P.; Morris, Harold D.; and Voelker, Scott F., to Systron-Donner. Accelerometer. 4,319,488, Cl. 73-509.000.
Hoechst Aktiengesellschaft: *See*—
Eckner, Gunter, 4,319,610, Cl. 138-131.000.
Meyer, Klaus, 4,319,910, Cl. 71-27.000.
Opitz, Konrad; and Schickfluss, Rudolf, 4,319,880, Cl. 8-526.000.
Scholz, Manfred; and Kaiser, Karl, 4,319,409, Cl. 34-58.000.
von dem Bussche, Gotz; and Koblo, Jochen, 4,319,826, Cl. 354-299.000.
Wolter, Manfred; and Heymer, Gero, 4,320,108, Cl. 423-461.000.
Hofert, Paul, to VDO Adolf Schindling AG. Setting device for analog-display motor vehicle clocks. 4,320,481, Cl. 368-190.000.
Hoffman, Dwight K., to Dow Chemical Company, The. Addition polymerizable isocyanate-polyol anaerobic adhesives. 4,320,221, Cl. 528-69.000.
Hoffman, Roy L.: *See*—
Heise, Nyles N.; Hoffman, Roy L.; Kiss, Istvan S.; Lewis, David O.; Pertzborn, James J.; and Robinson, Thomas S., 4,320,456, Cl. 364-200.000.
Hoffmann-La Roche Inc.: *See*—
Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., 4,320,056, Cl. 260-239.30T.
Dotz, Karl H., 4,320,065, Cl. 260-438.50R.
Wiederkehr, Hermann, 4,320,236, Cl. 568-813.000.
Hofmann, Eberhard, to Schubert & Salzer. Open end spinning rotor comprising a main body and a rotor body. 4,319,449, Cl. 57-58.890.
Hofmann, Frank, to Walter Hofmann, Firma. Spray gun for applying granulated material. 4,319,717, Cl. 239-654.000.
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, to Owens-Corning Fiberglas Corporation. Method and apparatus for preheating glass batch. 4,319,903, Cl. 65-27.000.
Hojo, Hiroshi; and Noguchi, Sadao. Method for modifying wool fiber materials to advance quality grade thereof. 4,319,879, Cl. 8-128.00R.
Hokari, Sadao: *See*—
Komuro, Katsu; Hokari, Sadao; and Maeda, Yasuyuki, 4,319,665, Cl. 187-29.00R.
Holman, James R.; and McIntyre, Robert N., to Western Electric Company, Inc. Telecommunication cable closure. 4,320,252, Cl. 174-21.00R.
Holonyak, Nick; and Rezek, Edward A., to University of Illinois Foundation. Homogeneous liquid phase epitaxial growth of heterojunction materials. 4,319,937, Cl. 148-171.000.
Holstin, Howard E.: *See*—
Lund, Clarence A.; Barron, Edward W.; Holstin, Howard E.; and Sugino, Michael D., 4,319,395, Cl. 29-571.000.
Homer, Claude: *See*—
Baudelet, Bernard; Suery, Michel; and Homer, Claude, 4,319,935, Cl. 148-32.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Sato, Masahiro; and Tanaka, Norio, 4,319,785, Cl. 301-6.0CS.
Honda, Hiroki: *See*—
Kondo, Jyunichi; Sensyu, Akira; Ono, Hidetaka; and Honda, Hiroki, 4,320,092, Cl. 422-224.000.
Honeywell Inc.: *See*—
Cash, Michael J., 4,320,165, Cl. 428-213.000.
Rose, Steven A.; and Forrester, Edward H., 4,320,450, Cl. 364-200.000.
Honeywell Information Systems Inc.: *See*—
Bachman, Charles W.; and Bouvard, Jacques, 4,320,451, Cl. 364-200.000.
Rathbun, Donald J.; and O'Keefe, David B., 4,320,465, Cl. 364-900.000.
Woods, William E.; Stanley, Philip E.; and Hirsch, Thomas S., 4,320,455, Cl. 364-200.000.
Honjo, Satoru: *See*—
Iwasa, Masakazu; Katou, Hisashi; and Honjo, Satoru, 4,320,408, Cl. 346-159.000.
Hoogenboom, Leo, to Mechanical Technology Incorporated. Fluid pressure regulator valve. 4,319,606, Cl. 137-625.300.
Hoppie, Lyle O., to Eaton Corporation. Regenerative braking device with rotationally mounted energy storage means. 4,319,655, Cl. 180-165.000.
Horie, Satoru: *See*—
Sakai, Koichi; and Horie, Satoru, 4,320,534, Cl. 455-267.000.
Horii, Horoshi; Itou, Masao; Matsumoto, Hidenosuke; and Marumo, Toshio, to Matsushita Electric Industrial Co., Ltd. Operation time control apparatus. 4,320,316, Cl. 307-595.000.
Horikawa, Izumi; and Shinji, Masaki, to Nippon Telegraph & Telephone Public Corporation. Digital signal reception system. 4,320,523, Cl. 375-103.000.
Horn, Josef, to Kibo Kommunalmaschinen GmbH & Co. KG. Hydromechanical change speed mechanism. 4,319,500, Cl. 74-720.000.
Horne, Richard J. Key retainer clip. 4,319,384, Cl. 24-3.00R.
Horner, Michael; Irgang, Matthias; and Nissen, Axel, to BASF Aktiengesellschaft. Preparation of olefinically unsaturated carbonyl compounds and alcohol. 4,320,228, Cl. 568-459.000.
Horster, Horst: *See*—
Hermann, Wilhelm; and Horster, Horst, 4,319,559, Cl. 126-442.000.
Hort, Eugene V.: *See*—
Parthasarathy, R.; and Hort, Eugene V., 4,320,031, Cl. 252-432.000.
Horton, James A., to Jersey Nuclear-Avco Isotopes, Inc. Rotating optical frequency chirp device. 4,319,807, Cl. 350-6.400.
Hoskinson, William R.: *See*—
Schwartz, Harold O.; Kidd, Dennis E.; and Hoskinson, William R., 4,319,508, Cl. 84-1.010.
Hotta, Masashi, to Shimano Industrial Company Limited. Constant temperature box. 4,319,629, Cl. 165-47.000.
Houle, Elmer R. Molding of rotary mower safety blade. 4,320,082, Cl. 264-257.000.
Howarth, John J., to Measurex Corporation. Apparatus to measure select properties of a moving sheet with improved standardization means. 4,319,847, Cl. 356-431.000.
Howden, Harry, to U.S. Philips Corporation. Method of producing aspherical optical elements. 4,319,945, Cl. 156-212.000.
Howe, Steven C.: *See*—
Norton, Richard V.; and Howe, Steven C., 4,320,238, Cl. 585-14.000.
Howerton, Murlin T.: *See*—
Papazian, Harold A.; and Howerton, Murlin T., 4,319,626, Cl. 165-1.000.
Papazian, Harold A.; and Howerton, Murlin T., 4,319,627, Cl. 165-1.000.
Hronek, George; and Gooden, Richmond A., to United Aircraft Products, Inc. Tubular heat exchanger. 4,319,630, Cl. 165-70.000.
Hu, Hsueh-Shun. Faster irrigation set for controlling colostomy. 4,319,569, Cl. 128-241.000.
Huber, Reinhold; and Koster, Waldemar, to Kober AG. Highway expansion joint. 4,319,855, Cl. 404-68.000.
Huckabay, Durward A.; and Skiathas, Arthur D., to Imperial West Chemical Company. Aluminum sulfate manufacture from aluminum dross tailings. 4,320,098, Cl. 423-132.000.
Huckabay, John M.; and Wallace, Reuben H., to United States of America, Navy. Saturation limited parametric sonar source. 4,320,474, Cl. 367-138.000.
Huggins, Dale K.: *See*—
Queneau, Paul B.; Huggins, Dale K.; and Beckstead, Leo W., 4,320,095, Cl. 423-61.000.
Queneau, Paul B.; Huggins, Dale K.; and Beckstead, Leo W., 4,320,096, Cl. 423-61.000.
Hughes Aircraft Company: *See*—
Lund, Roger E.; and Wirick, Michael P., 4,320,462, Cl. 364-525.000.
Hughes, R. Lyle, to Southern California Gas Company. Two liquid heat exchange system and safety valve to prevent contamination. 4,319,623, Cl. 165-39.000.
Hugin Kassaregister AB: *See*—
Akerstrom, Bengt; and Molinder, Per, 4,319,837, Cl. 355-73.000.
Huignard, Jean-Pierre: *See*—
Leclerc, Pierre; Huignard, Jean-Pierre; Papuchon, Michel; and Puech, Claude, 4,320,475, Cl. 367-149.000.
Hull, James R. Bathroom and kitchen fixtures. 4,319,687, Cl. 211-105.200.
Hultsch, Gunther; and Wilkesmann, Helmut, to Krauss-Maffei Aktiengesellschaft. Pusher-type centrifuge filters. 4,320,007, Cl. 210-376.000.
Hunt, Harold R., to Phillips Petroleum Company. Apparatus for producing a high DPG carbon black. 4,320,090, Cl. 422-150.000.
Hunter Douglas, Inc.: *See*—
Gussow, Christopher H., 4,319,439, Cl. 52-288.000.
Hunter Engineering Company: *See*—
Grossman, James M.; and January, Daniel B., 4,319,838, Cl. 356-152.000.
Hunter, Lee. Vehicle service jack. 4,319,666, Cl. 187-43.000.
Huttenwerke Kayser Aktiengesellschaft: *See*—
Schatton, Helmut; and Krickau, Walter, 4,319,970, Cl. 204-106.000.
Huttlin, Herbert. Bottom screen for fluidized bed apparatus. 4,320,089, Cl. 422-140.000.
Hydril Company: *See*—
Mott, James D., 4,319,639, Cl. 166-377.000.
Hynes, Roger P.; and Stackhouse, Karl A., to Western Electric Co., Inc. Composite material for mounting electronic devices. 4,320,412, Cl. 357-70.000.
Ibrahim, Shawki; and Elsner, James E., to CTS Corporation. Multilayer ceramic package. 4,320,438, Cl. 361-401.000.
Ichinose, Hiroyuki: *See*—
Taira, Tadaaki; Hirabayashi, Kiyoteru; Ichinose, Hiroyuki; Hirano, Osamu; and Suzuki, Motoaki, 4,320,277, Cl. 219-61.000.
Ichiyanagi, Toshikazu, to Canon Kabushiki Kaisha. Switching control system. 4,320,518, Cl. 375-17.000.
Igel, Wolfgang, to Zinser Textilmaschinen GmbH. Pneumatically cushioned spinning ring system. 4,319,450, Cl. 57-261.000.
Ihara, Makoto. Filter device. 4,320,002, Cl. 210-178.000.
Iida, Toshihide: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,319,828, Cl. 355-3.00R.
Iizuka, Kinji; Akahane, Kenji; Kamijo, Yukio; Momose, Denichi; and Ajisawa, Yukiyoshi, to Ono Pharmaceutical Co., Ltd.; and Kissei Pharmaceutical Co., Ltd. Inhibiton of thromboxane synthetase with 1-substituted imidazole compounds. 4,320,134, Cl. 424-273.00R.
Ikeda, Saburo, to Sanyo Electric Co., Ltd. Channel selecting apparatus employing frequency synthesizer. 4,320,530, Cl. 455-182.000.
Imai, Kazuhiro; Yamada, Shigemitsu; Kubota, Hidehiro; and Sakamaki, Jun, to ATTO Corporation. Method for determining catecholic compounds and their related compounds. 4,319,883, Cl. 23-230.00B.
IMI Kynoch Limited: *See*—
Wortley, John P. A., 4,319,977, Cl. 204-280.000.

Immler, Josef, to Siemens Aktiengesellschaft. Circuit arrangement for the on-off switching of a line voltage to and from a load. 4,320,336, Cl. 323-324.000.

Imperial Chemical Industries Limited: *See—*
Birchall, James D.; and Morton, Michael J., 4,320,074, Cl. 264-8.000.
Dutta, Anand S.; Gormley, James J.; Hayward, Christopher F.; Morley, John S.; and Stacey, Gilbert J., 4,320,117, Cl. 424-177.000.
Robinson, James D., 4,319,370, Cl. 5-201.000.
Rose, John B.; and Staniland, Philip A., 4,320,224, Cl. 528-125.000.

Imperial West Chemical Company: *See—*
Huckabay, Durward A.; and Skiathas, Arthur D., 4,320,098, Cl. 423-132.000.

Inamine, Shigeo: *See—*
Ueno, Ryuzo; Kanayama, Tatsuo; Matsuda, Toshio; Tomiyasu, Kunihiko; and Inamine, Shigeo, 4,320,153, Cl. 426-643.000.

Inco Limited: *See—*
Babjak, Juraj, 4,320,099, Cl. 423-139.000.

Industrial Magnetics, Inc.: *See—*
Wyland, Donald J.; and Stowe, Michael W., 4,319,989, Cl. 209-225.000.

Ing. C. Olivetti & C., S.p.A: *See—*
Navone, Lorenzo, 4,319,835, Cl. 355-50.000.

Ingard, Karl U.: *See—*
Gorchev, Dimiter; Ingard, Karl U.; and Willke, Herbert L., Jr., 4,319,521, Cl. 98-38.00E.

Ingle, Lee E., to Jewett, Warren R., a part interest. Animal birth detector. 4,319,583, Cl. 128-775.000.

Ingram, Maxwell, to Marine Electric Corporation. Safety valve for exposing a measuring probe to a fluid. 4,320,343, Cl. 324-450.000.

Innovative Enterprises, Inc.: *See—*
Moog, John F., 4,319,530, Cl. 108-51.300.

Ino, Hidetoshi: *See—*
Kobayashi, Sumio; Takahashi, Tadashi; Ino, Hidetoshi; and Sakai, Takami, 4,320,445, Cl. 363-54.000.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,320,280, Cl. 219-69.00W.

Inoue, Kazuo: *See—*
Maeda, Hidetoshi; Inoue, Kazuo; and Someno, Noboru, 4,320,529, Cl. 455-158.000.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Traveling-wire EDM method. 4,320,280, Cl. 219-69.00W.

Inoue, Minoru: *See—*
Momosaki, Eishi; Kogure, Shigeru; and Inoue, Minoru, 4,320,320, Cl. 310-361.000.

Inoue, Shoji. Apparatus for classifying and reorganizing a processed long length of film into lengths of film having same frame size. 4,319,946, Cl. 156-350.000.

Institut Francais du Petrole: *See—*
Chauvin, Yves; Gaillard, Jean; Leger, Gerard; and Van Landeghem, Hugo, 4,320,243, Cl. 585-521.000.
Jaffrennou, Bernard; and Cessou, Maurice, 4,319,858, Cl. 405-68.000.
Rebeller, Michel; Yout, Pierre; and Lonchamp, Daniel, 4,320,050, Cl. 260-112.00R.

Instytut Wlokiennictwa: *See—*
Jozwicki, Ryszard; Kluska, Bogdan; Radom, Czeslaw; and Pacholski, Jan, 4,319,448, Cl. 57-58.890.

International Business Machines Corporation: *See—*
Alvarez, Joseph A., III; Bensadon, Joseph M.; Brennen, John F.; Brickman, Norman F.; and Krug, Robert W., 4,320,504, Cl. 370-104.000.
Bahr, Dietrich J.; and Burckardt, Karl-Heinz, 4,320,330, Cl. 318-685.000.
deVeer, John A., 4,320,502, Cl. 370-85.000.
Dollenmayer, William L., 4,319,849, Cl. 400-144.200.
Findlay, Hugh T., 4,320,170, Cl. 428-336.000.
Godard, Dominique N.; and Quintin, Michel Y., 4,320,517, Cl. 375-13.000.
Heise, Nyles N.; Hoffman, Roy L.; Kiss, Istvan S.; Lewis, David O.; Pertzborn, James J.; and Robinson, Thomas S., 4,320,456, Cl. 364-200.000.
Jambotkar, Chakrapani G., 4,319,932, Cl. 148-1.500.
Janeway, Donald L., III; and Stevenson, Peter A., 4,319,829, Cl. 355-3.0BE.
Larson, Richard T.; McMurtry, David H.; and Rinkleib, Helfried O., 4,320,421, Cl. 360-60.000.
Rinkleib, Helfried O., 4,320,422, Cl. 360-60.000.
Rood, Allan J., 4,319,743, Cl. 271-184.000.

International Flavors & Fragrances Inc.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Granda, Edward J.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,319,586, Cl. 131-276.000.

International Harvester Company: *See—*
Kolthoff, C. Paul, 4,319,866, Cl. 416-210.00R.

International Telephone and Telegraph Corporation: *See—*
Acar, Ali, 4,319,734, Cl. 251-174.000.
John, Robert S., Jr., 4,320,394, Cl. 340-618.000.

International Tools (1973) Limited: *See—*
Birrell, Stewart H.; and Hedgewick, Peter, 4,319,690, Cl. 215-220.000.

Inventa AG fur Forschung und Patentverwertung Zurich: *See—*
Bertossa, Guiseppe, 4,320,066, Cl. 260-439.0CY.

Irgang, Matthias: *See—*
Horner, Michael; Irgang, Matthias; and Nissen, Axel, 4,320,228, Cl. 568-459.000.

Irvin, Howard B., to Phillips Petroleum Company. Apparatus for two stage catalytic hydrogenation of olefinically unsaturated dinitriles. 4,320,091, Cl. 422-190.000.

Irvine, Douglas S.: *See—*
Hirsch, Michael A.; Irvine, Douglas S.; and Krupey, John, 4,320,111, Cl. 424-12.000.

Irwin, Arthur S., to TRW Inc. Roller bearing and anti-skewing system therefor. 4,319,789, Cl. 308-207.00R.

Iseki, Tsutomu: *See—*
Iuchi, Munenori; Iseki, Tsutomu; Takeyama, Yoshinori; and Ohira, Masuhiro, 4,319,622, Cl. 152-362.00R.

Isfan, Lydia: *See—*
Visan, Michel; and Isfan, Lydia, 4,320,264, Cl. 179-115.50R.

Ishida, Masamitsu; Kato, Hisatoyo; and Matsumoto, Seiji, to Fuji Photo Film Co., Ltd. Method of and apparatus for recording image processing data in radiation image recording system. 4,320,296, Cl. 250-327.100.

Ishii, Tsuneo: *See—*
Kikuchi, Takashi; and Ishii, Tsuneo, 4,320,493, Cl. 369-220.000.

Ishii, Yoshiya; Fujitani, Nobuyuki; and Dohshita, Hidetoshi, to Nippondenso Co., Ltd. Engine stop apparatus. 4,319,550, Cl. 123-198.0DB.

Ishizone, Hiroyuki: *See—*
Hashimoto, Yohei; Ogura, Masaru; and Ishizone, Hiroyuki, 4,320,225, Cl. 536-4.000.

Itec, Inc.: *See—*
Atkinson, Roger F., 4,320,259, Cl. 179-18.0FG.

Ito, Akihiko; and Saeki, Noriaki, to NTN Toyo Bearing Company, Ltd. Constant velocity joint. 4,319,465, Cl. 64-21.000.

Itoh, Kyohichi: *See—*
Otani, Shuichi; Kato, Shinichi; Hashimoto, Susumu; and Itoh, Kyohichi, 4,319,797, Cl. 339-75.00R.

Itou, Masao: *See—*
Horii, Horoshi; Itou, Masao; Matsumoto, Hidenosuke; and Marumo, Toshio, 4,320,316, Cl. 307-595.000.

Itou, Tomio; and Kitagawa, Toshiyuki, to TDK Electronics Company, Ltd. Thermo-sensitive reed switch. 4,320,370, Cl. 335-208.000.

ITT Industries, Inc.: *See—*
Gille, Gunther; Goertler, Horst; and Prohaska, Hans, 4,320,329, Cl. 318-443.000.

Iuchi, Munenori; Iseki, Tsutomu; Takeyama, Yoshinori; and Ohira, Masuhiro, to Sumitomo Rubber Industries, Ltd. Pneumatic tire with improved bead construction. 4,319,622, Cl. 152-362.00R.

Iura, Yukio; Yamamichi, Masayoshi; Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, to Canon Kabushiki Kaisha. Camera employing a flash illumination device and a flash photographing system. 4,319,814, Cl. 354-33.000.

Ivaschenko, Pavel A.: *See—*
Raikov, Ivan Y.; Ivaschenko, Pavel A.; and Samoilovsky, Igor V., 4,319,608, Cl. 137-625.480.

Iwamura, Tadaaki; and Tamiya, Toshio, to Kawasaki Steel Corporation. Method and an apparatus for detecting leakage of cooling water by measuring dissolved CO amount. 4,319,479, Cl. 73-19.000.

Iwasa, Masakazu; Katou, Hisashi; and Honjo, Satoru, to Fuji Photo Film Co., Ltd. Method of forming electrostatic image. 4,320,408, Cl. 346-159.000.

Iwasa, Yoshio: *See—*
Morita, Hideo; and Iwasa, Yoshio, 4,319,452, Cl. 60-293.000.

Iwasaki, Shinichiro, to Aisin Seiki Company, Limited. Pulse duty control system. 4,320,308, Cl. 307-106.000.

Izumi, Tosio: *See—*
Okuda, Yukio; Katayama, Naohiro; and Izumi, Tosio, 4,320,448, Cl. 363-134.000.

J. M. Voith GmbH: *See—*
Wolf, Robert, 4,319,390, Cl. 29-116.0AD.

Jackson, Auzville, Jr.: *See—*
Barker, Charles E.; Cairo, Anthony C.; Bauer, Frederick T.; and Jackson, Auzville, Jr., 4,319,711, Cl. 236-46.00R.

Jackson, Gerald D.: *See—*
McMahan, Michael E.; Jackson, Gerald D.; and Barrington, Burchus Q., 4,319,633, Cl. 166-250.000.

Jackson, Lonnie A. Nail polish removing device. 4,319,596, Cl. 132-73.600.

Jaeger: *See—*
Lumbroso, Sylvain J., 4,320,383, Cl. 340-71.000.

Jaffrennou, Bernard; and Cessou, Maurice, to Societe Anonyme ROLBA; and Institut Francais du Petrole. High resistance flexible boom. 4,319,858, Cl. 405-68.000.

Jakobsen, Kjell M., to Platmanufaktur AB. Process of preparing reinforced container. 4,320,083, Cl. 264-531.000.

Jambotkar, Chakrapani G., to International Business Machines Corporation. Method of making high performance bipolar transistor with polysilicon base contacts. 4,319,932, Cl. 148-1.500.

James David Mfg. Corp.: *See—*
Clyburn, C. Wayne, 4,319,512, Cl. 84-318.000.

Jamestown Group: *See—*
Schwartz, Larry A.; Geiter, Robert; and Albertsen, Peter S., 4,319,556, Cl. 126-77.000.

Janeway, Donald L., III; and Stevenson, Peter A., to International Business Machines Corporation. Noncircular photoconductor belt mounting apparatus and method. 4,319,829, Cl. 355-3.0BE.

Janome Sewing Machine Co., Ltd.: *See—*
Kasuga, Noboru, 4,319,533, Cl. 112-158.00E.

January, Daniel B.: *See*—
Grossman, James M.; and January, Daniel B., 4,319,838, Cl. 356-152.000.

Japan Hydrazine: *See*—
Takematsu, Tetsuo; and Tsuchiya, Hideshi, 4,319,915, Cl. 71-92.000.

Jarvis, Wilbur W.: *See*—
Dingler, Geoffrey L.; Jarvis, Wilbur W.; and Spiegel, Raymond W., 4,319,598, Cl. 134-57.00D.
Dingler, Geoffrey L.; Jarvis, Wilbur W.; and Spiegel, Raymond W., 4,319,599, Cl. 134-104.000.

Jean-Claude Berney SA: *See*—
Berney, Jean-Claude, 4,320,476, Cl. 368-28.000.

Jegousse, Michel J.; and De Sivry, Bruno J. M., to Compagnie Francaise des Petroles. Positioning of an additional tubular element on a tubular structure. 4,319,709, Cl. 228-213.000.

Jenkins, Rodman. Method for treating coal to obtain a refined carbonaceous material. 4,319,980, Cl. 208-8.0LE.

Jenson, Roger E.: *See*—
Pryor, Jerry C.; and Jenson, Roger E., 4,319,921, Cl. 75-65.00R.

Jeppson, Morris R., to Microdry Corportion; Laurmann, Giselle V.; Blurton, Richard R.; and Blurton, Claire M., part interest to each. Microwave method and apparatus for reprocessing pavements. 4,319,856, Cl. 404-79.000.

Jerphagnon, Jean: *See*—
Chemla, Daniel; Cot, Louis; Jerphagnon, Jean; and Durand, Jean, 4,320,178, Cl. 428-698.000.

Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Horton, James A., 4,319,807, Cl. 350-6.400.

Jeter, John D. Stabilizer. 4,319,649, Cl. 175-73.000.

Jewett, Warren R.: *See*—
Ingle, Lee E., 4,319,583, Cl. 128-775.000.

John O. Butler Company: *See*—
Tarrson, Emanuel B.; and Maric, Dane, 4,319,377, Cl. 15-111.000.

John, Robert S., Jr., to International Telephone and Telegraph Corporation. Fiber optics liquid level and flow sensor system. 4,320,394, Cl. 340-618.000.

Johns-Hopkins University, The: *See*—
Keller, Christian A., 4,319,484, Cl. 73-304.00C.
Walser, Mackenzie, 4,320,146, Cl. 424-319.000.

Johnson, Bruce K., to Polaroid Corporation. Camera having built-in, close-up lens. 4,319,817, Cl. 354-127.000.

Johnson, Roger R.; Kleinhagen, Charles W., Jr.; Neuman, Richard F.; and Winckler, Peter S., to Eaton Corporation. Push-pull caliper. 4,319,668, Cl. 188-72.400.

Jones, Gordon H.: *See*—
White, Abraham, deceased; Nestor, John J.; Jones, Gordon H.; and Burton, Pamela M., 4,320,118, Cl. 424-177.000.

Jones, Leon W. Registered guide for graphic reproduction. 4,319,401, Cl. 33-174.00B.

Jones, Lonnie R.; and Hill, Joseph L. Composition for pest repellent receptacle. 4,320,112, Cl. 424-19.000.

Jones, Paul H., to P. H. Jones Hydrogeology, Inc. Method for enhanced oil recovery by geopressured waterflood. 4,319,635, Cl. 166-263.000.

Jones, Raymond D., to TII Industries, Inc. Surge arrester assembly. 4,320,435, Cl. 361-119.000.

Jones, Robin, to National Research Development Corporation. Method of and apparatus for measuring electrophoretic mobility of cells. 4,320,415, Cl. 358-105.000.

Joppien, Hartmut: *See*—
Puttner, Reinhold; Buhmann, Ulrich; and Joppien, Hartmut, 4,320,125, Cl. 424-248.510.

Jozwicki, Ryszard; Kluska, Bogdan; Radom, Czeslaw; and Pacholski, Jan, to Instytut Wlokiennictwa. Process and apparatus for producing yarn. 4,319,448, Cl. 57-58.890.

Judd, Melvin L. Barrier structure for controlling ground crawling, non-burrowing insects. 4,319,423, Cl. 43-121.000.

Jun, Mong-Jon: *See*—
Heinz, Gerhard; Richter, Peter; and Jun, Mong-Jon, 4,320,188, Cl. 430-281.000.

Jung, Johann: *See*—
Ammermann, Eberhard; Rentzea, Costin; and Jung, Johann, 4,319,911, Cl. 71-76.000.

Justice, Gregory, to Apple Computer, Inc. Auto balancing duplexer for communication lines. 4,320,498, Cl. 370-27.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Nakao, Hideyuki, 4,320,482, Cl. 368-201.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Kato, Hiroshi; and Mishima, Toshio, 4,319,511, Cl. 84-1.220.

Kabushiki Kaisha Suwa Seikosha: *See*—
Momosaki, Eishi; Kogure, Shigeru; and Inoue, Minoru, 4,320,320, Cl. 310-361.000.

Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Motonami, Masanao; Yasumatsu, Jun; and Tsujiuchi, Yoshio, 4,319,667, Cl. 188-65.100.

Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo: *See*—
Ueno, Ryuzo; Kanayama, Tatsuo; Matsuda, Toshio; Tomiyasu, Kunihiko; and Inamine, Shigeo, 4,320,153, Cl. 426-643.000.

K.K. Matsushiro: *See*—
Matsushiro, Yukimitsu, 4,320,441, Cl. 362-65.000.

Kaiser, Karl: *See*—
Scholz, Manfred; and Kaiser, Karl, 4,319,409, Cl. 34-58.000.

Kaken Chemical Co., Ltd.: *See*—
Nagato, Shoin; Takagi, Nobuo; and Obara, Heitara, 4,319,919, Cl. 71-124.000.

Kali-Chemie Pharma GmbH: *See*—
Ohlendorf, Heinrich-Wilhelm; Wolf, Klaus-Ullrich; Kaupmann, Wilhelm; and Heinemann, Henning, 4,320,061, Cl. 260-333.000.

Kallianos, Andrew G.; and Southwick, Everett W., to Liggett Group Inc. 7-Methyl-1,2-benzopyrone as a tobacco flavorant. 4,319,585, Cl. 131-275.000.

Kamei, Syun: *See*—
Morishita, Sadao; Okumura, Fumio; Higuchi, Masahiro; Miyauchi, Masahiro; and Kamei, Syun, 4,320,039, Cl. 525-54.420.

Kamijo, Yukio: *See*—
Iizuka, Kinji; Akahane, Kenji; Kamijo, Yukio; Momose, Denichi; and Ajisawa, Yukiyoshi, 4,320,134, Cl. 424-273.00R.

Kammerlander, Karl, to Siemens Aktiengesellschaft. Circuit for ascertaining of the phase jitter of digital signals. 4,320,516, Cl. 375-10.000.

Kamoi, Nobuhisa: *See*—
Suzuki, Shinjiro; Yoshikawa, Tadashi; Otsuki, Tsuguo; Takeda, Masao; Kamoi, Nobuhisa; and Satoh, Kazuo, 4,320,348, Cl. 330-52.000.

Kanayama, Tatsuo: *See*—
Ueno, Ryuzo; Kanayama, Tatsuo; Matsuda, Toshio; Tomiyasu, Kunihiko; and Inamine, Shigeo, 4,320,153, Cl. 426-643.000.

Kanebo, Ltd.: *See*—
Matsui, Masao; and Naito, Hiroshi, 4,319,831, Cl. 355-15.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Yonezawa, Kazuya; and Osawa, Tadashi, 4,320,215, Cl. 526-62.000.

Kaneko, Yoichi: *See*—
Takeuchi, Takashi; Kaneko, Yoichi; and Owatari, Hisato, 4,320,276, Cl. 219-10.810.

Kaplan, Leonard, to Union Carbide Corporation. Ammonium carboxylates. 4,320,063, Cl. 260-404.500.

Kaplan, Robert H.: *See*—
Kempner, Alan L.; and Kaplan, Robert H., 4,319,894, Cl. 55-71.000.

Karickhoff, John R. Instrument for measurement of the diameter of the anterior chamber of the eye. 4,319,564, Cl. 128-774.000.

Karlsson, Jan; and Raimel, Gert, to New Environment Energy Development Aktiebolag (NEED). Apparatus for increasing the flow speed of a medium and for recovering its kinetic energy. 4,320,304, Cl. 290-55.000.

Karstedt, Bruce D.: *See*—
Keith, Charles H.; and Karstedt, Bruce D., 4,319,591, Cl. 131-359.000.

Kaschte, Walter, to Siemens Aktiengesellschaft. Monolithically integrated filter circuit. 4,320,363, Cl. 333-165.000.

Kashiwara, Tomokazu: *See*—
Fujii, Masaru; Kashiwara, Tomokazu; and Yamaguchi, Tetsuo, 4,319,539, Cl. 114-219.000.

Kaster, Robert L., to Kaster, Robert L. Pivoting disc heart valve. 4,319,364, Cl. 3-1.500.

Kasuga, Noboru, to Janome Sewing Machine Co., Ltd. Automatic sewing machine. 4,319,533, Cl. 112-158.00E.

Katayama, Naohiro: *See*—
Okuda, Yukio; Katayama, Naohiro; and Izumi, Tosio, 4,320,448, Cl. 363-134.000.

Katayama, Yuzo: *See*—
Oikawa, Shigeru; Katayama, Yuzo; Takato, Norio; and Kurokawa, Takashi, 4,320,292, Cl. 250-227.000.

Kathawala, Faizulla G., to Sandoz, Inc. Inhibiting growth hormone secretion with 5,5-substituted hydantoin derivatives. 4,320,135, Cl. 424-273.00R.

Kato, Hiroshi; and Mishima, Toshio, to Kabushiki Kaisha Kawai Gakki Seisakusho. Tone source for an electronic musical instrument. 4,319,511, Cl. 84-1.220.

Kato, Hisatoyo: *See*—
Ishida, Masamitsu; Kato, Hisatoyo; and Matsumoto, Seiji, 4,320,296, Cl. 250-327.100.

Kato, Mamoru; Matsumoto, Shoji; and Aizawa, Tatsuo, to Mita Industrial Company Limited. Electrographic method for preparing original for projection and transfer film for use in method. 4,320,186, Cl. 430-98.000.

Kato, Mitsuru: *See*—
Kawai, Takuro; and Kato, Mitsuru, 4,319,721, Cl. 242-107.40A.

Kato, Shinichi: *See*—
Otani, Shuichi; Kato, Shinichi; Hashimoto, Susumu; and Itoh, Kyohichi, 4,319,797, Cl. 339-75.00R.

Katou, Hisashi: *See*—
Iwasa, Masakazu; Katou, Hisashi; and Honjo, Satoru, 4,320,408, Cl. 346-159.000.

Katz, Jerome; and Fogel, Sidney J. Apparatus for high volume distillation of liquids. 4,319,964, Cl. 202-172.000.

Kaufeldt, Roland. Apparatus for producing rapid movement and smooth braking and a precisely defined final position of a movable robot arm. 4,319,864, Cl. 414-750.000.

Kaufhold, Manfred; and Gaube, Johann, to Chemische Werke Huls AG. Process for the hydroformylation of olefins. 4,320,237, Cl. 568-909.000.

Kaupmann, Wilhelm: *See*—
Ohlendorf, Heinrich-Wilhelm; Wolf, Klaus-Ullrich; Kaupmann, Wilhelm; and Heinemann, Henning, 4,320,061, Cl. 260-333.000.

Kavick, Edward M., to Eaton Corporation. Hose and coupling assembly. 4,319,774, Cl. 285-256.000.

Kawagoe, Katsuaki; and Kawaji, Hideki, to Anritsu Electric Company Limited. Sweep signal generation system. 4,320,355, Cl. 331-2.000.

Kawaguchi, Hideo: *See*—
Fukuzawa, Koji; and Kawaguchi, Hideo, 4,319,398, Cl. 29-598.000.

Kawaguchi, Hiroshi: *See*—
Tomita, Koji; Tsukiura, Hiroshi; and Kawaguchi, Hiroshi, 4,320,199, Cl. 435-121.000.
Kawai, Takuro; and Kato, Mitsuru, to Fuji Kiko Kabushiki Kaisha. Safety belt retractor. 4,319,721, Cl. 242-107.40A.
Kawaji, Hideki: *See*—
Kawagoe, Katsuaki; and Kawaji, Hideki, 4,320,355, Cl. 331-2.000.
Kawasaki Steel Corporation: *See*—
Iwamura, Tadaaki; and Tamiya, Toshio, 4,319,479, Cl. 73-19.000.
Kawneer Company, Inc.: *See*—
Redman, Ronald E., 4,320,161, Cl. 428-122.000.
Kazienko, Henry J.: *See*—
Sznopek, John L.; Lostak, Charles; Heisler, Robert W.; Ferraro, Joseph P.; and Kazienko, Henry J., 4,319,950, Cl. 156-475.000.
Kearney-National (Canada) Limited: *See*—
Narancic, Vojislav; and Braunovic, Milenko, 4,320,374, Cl. 337-162.000.
Keck, John W.: *See*—
Shaw, Donald L.; McGlothlin, Quentin T.; O'Brien, Barry M.; Keck, John W.; and Freyberger, Wilfred L., 4,319,987, Cl. 209-166.000.
Keeffe, William M.: *See*—
Rothwell, Harold L., Jr.; Keeffe, William M.; and Gungle, W. Calvin, 4,320,322, Cl. 313-217.000.
Keim, Karl-Heinz: *See*—
Meisenburg, Ewald; and Keim, Karl-Heinz, 4,319,982, Cl. 208-11.00R.
Keim, William A.: *See*—
Cook, James A., Jr.; and Keim, William A., 4,320,070, Cl. 260-455.00A.
Keith, Charles H.; and Karstedt, Bruce D., to Celanese Corporation. Smoking compositions. 4,319,591, Cl. 131-359.000.
Keller, Christian A., to Johns-Hopkins University, The. Linear response capacitance wave height measuring system. 4,319,484, Cl. 73-304.00C.
Kelley, Stephen H.; and Wurzburg, Henry, to Motorola, Inc. (Sin X)/X correction circuit for a sampled data system. 4,320,519, Cl. 375-26.000.
Kellner, Ferdinand. Prism view finder for reflex cameras with built-in exposure meter. 4,319,815, Cl. 354-59.000.
Kellner, Ferdinand. Prism viewfinder for reflex cameras with built-in light meter. 4,319,816, Cl. 354-56.000.
Kells, Edward L.: *See*—
Dejaiffe, Robert; and Kells, Edward L., 4,320,244, Cl. 13-6.000.
Kelly, Gordon: *See*—
Bemis, Richard A.; and Kelly, Gordon, 4,319,365, Cl. 4-236.000.
Kemmer, Frank N., to Nalco Chemical Company. Optimizing the quality of steam from geothermal fluids. 4,319,895, Cl. 55-73.000.
Kempf, Mark F.; Randall, D'Arcy C.; and Walworth, Timothy R., to Standard Oil Company (Indiana). Digital bus and control circuitry for data routing and transmission. 4,320,452, Cl. 364-200.000.
Kempner, Alan L.; and Kaplan, Robert H., to Stauffer Chemical Company. Process and process apparatus for separating gaseous phosphorus trichloride from a gas stream. 4,319,894, Cl. 55-71.000.
Kemtune, Inc.: *See*—
Sanderson, Charles H.; and Sanderson, Charles W., 4,320,003, Cl. 210-222.000.
Kennedy, Warren C.: *See*—
McDonald, John F.; Scarton, Henry A.; Kennedy, Warren C.; and Crilly, Paul B., 4,320,282, Cl. 219-137.0PS.
Kenyaky Yogyo Kabushiki Kaisha: *See*—
Mizuno, Den-ichi; Mitsuhashi, Hiroshi; Abe, Shigeru; and Hayashi, Koji, 4,320,119, Cl. 424-182.000.
Keogh, Michael J., to Union Carbide Corporation. Flame retardant composition based on an alkylene-alkyl acrylate copolymer, coated talc filler and a non-polar flame retardant. 4,320,038, Cl. 523-216.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Meissen, Ralf; Loser, Friedrich; Berwix, Joachim; and Krischer, Christof, 4,320,395, Cl. 340-726.000.
Kerr, Edwin R.: *See*—
Love, Richard F.; Dorawala, Tansukhlal G.; and Kerr, Edwin R., 4,320,240, Cl. 585-419.000.
Kethuranathan, Vettivetpillai. Vascular prostheses. 4,319,363, Cl. 3-1.400.
Keyline Research & Development Corporation: *See*—
Lurix, Paul, 4,319,887, Cl. 44-72.000.
Khomyak, Anatoly S.: *See*—
Alexandrov, Vitaly V.; Bezlepkin, Anatoly I.; Konstantinov, Boris A.; Melnikova, Olga V.; Khomyak, Anatoly S.; Schukin, Lev I.; and Chukin, Marat S., 4,320,321, Cl. 313-209.000.
Kibo Kommunalmaschinen GmbH & Co. KG: *See*—
Horn, Josef, 4,319,500, Cl. 74-720.000.
Kidd, Dennis E.: *See*—
Schwartz, Harold O.; Kidd, Dennis E.; and Hoskinson, William R., 4,319,508, Cl. 84-1.010.
Kikkert, Cornelis J., to Marconi Instruments Limited. Amplitude and frequency modulators using a switchable component controlled by data signals. 4,320,361, Cl. 332-16.00R.
Kikuchi, Hisashi: *See*—
Kozai, Katsuya; Makino, Teruyoshi; and Kikuchi, Hisashi, 4,320,187, Cl. 430-207.000.
Kikuchi, Takashi; and Ishii, Tsuneo, to Pioneer Electronic Corporation. Linear tracking arm assembly with electric brake. 4,320,493, Cl. 369-220.000.
Kikuchi, Takashi, to Pioneer Electronic Corporation. Tone arm return system for record player with eccentric spindle hole immunity. 4,320,495, Cl. 369-226.000.
Kikuchi, Takashi, to Pioneer Electronic Corporation. Tone arm return systems for record player with eccentric spindle hole immunity. 4,320,496, Cl. 369-226.000.
Kikuchi, Takefusa, to Taiyu Shoji Kabushiki Kaisha. Centrifugal oil separator. 4,320,006, Cl. 210-369.000.
Kikuchi, Yuji: *See*—
Otake, Yukio; Kikuchi, Yuji; Nakanishi, Tsuneo; and Miyakozawa, Keiji, 4,319,505, Cl. 83-295.000.
Kim, Jin K.; Murphy, Clarence R.; and Smith, Edward W., to Gulf Oil Corporation. Ethylene polymer fibrils. 4,320,210, Cl. 525-57.000.
Kindlmann, Peter J.; Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., to Olin Corporation. Electromagnetic casting process utilizing an active transformer-driven copper shield. 4,319,625, Cl. 164-467.000.
King, Arthur S. Apparatus for extracting polar substances from solution. 4,319,979, Cl. 204-302.000.
Kinney, Ohler L., Jr.: *See*—
Bugler, Thomas W., III; Lillig, Donald J.; Brown, Thomas L.; and Kinney, Ohler L., Jr., 4,320,073, Cl. 261-112.000.
Kipper, Hans, to PHB-Weserhutte AG. Stockyard transporter and tripper car equipment. 4,319,677, Cl. 198-585.000.
Kiriyama, Shigeki: *See*—
Abe, Katsuhiro; Tsuruoka, Mitsuo; Kiriyama, Shigeki; and Nakamori, Kazunobu, 4,320,041, Cl. 524-503.000.
Kishikawa, Eizo: *See*—
Mori, Hideyasu; and Kishikawa, Eizo, 4,320,497, Cl. 370-14.000.
Kiss, Istvan S.: *See*—
Heise, Nyles N.; Hoffman, Roy L.; Kiss, Istvan S.; Lewis, David O.; Pertzborn, James J.; and Robinson, Thomas S., 4,320,456, Cl. 364-200.000.
Kissei Pharmaceutical Co., Ltd.: *See*—
Iizuka, Kinji; Akahane, Kenji; Kamijo, Yukio; Momose, Denichi; and Ajisawa, Yukiyoshi, 4,320,134, Cl. 424-273.00R.
Kitagawa, Toshiyuki: *See*—
Itou, Tomio; and Kitagawa, Toshiyuki, 4,320,370, Cl. 335-208.000.
Kitamura, Shuji: *See*—
Fujita, Fumio; Kitamura, Shuji; Tamura, Toshifumi; and Nagase, Tsuneyuki, 4,320,040, Cl. 524-459.000.
Kiuchi, Mitsuyuki, to Matsushita Electric Industrial Company, Limited. Apparatus for heating an electrically conductive cooking utensil by magnetic induction. 4,320,273, Cl. 219-10.49R.
Kiwala, Jacob: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Granda, Edward J.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,319,586, Cl. 131-276.000.
Kiyofuji, Shinji: *See*—
Taniguchi, Harutaka; Hara, Kenichi; Shiraishi, Hideo; and Kiyofuji, Shinji, 4,320,378, Cl. 338-34.000.
Klaus, Gerald R., to Fellowes Manufacturing Company. Flat file. 4,319,795, Cl. 312-330.00R.
Kleimann, Helmut: *See*—
von Bonin, Wulf; Kleimann, Helmut; and Freitag, Hans-Albrecht, 4,320,067, Cl. 260-453.0AR.
Kleinhagen, Charles W., Jr.: *See*—
Johnson, Roger R.; Kleinhagen, Charles W., Jr.; Neuman, Richard F.; and Winckler, Peter S., 4,319,668, Cl. 188-72.400.
Kleinschmit, Peter: *See*—
Bittner, Friedrich; Voigt, Carl; and Kleinschmit, Peter, 4,320,104, Cl. 423-375.000.
Klotz, James M.: *See*—
Collins, Glenn A., Jr.; and Klotz, James M., 4,319,924, Cl. 106-14.120.
Kluska, Bogdan: *See*—
Jozwicki, Ryszard; Kluska, Bogdan; Radom, Czeslaw; and Pacholski, Jan, 4,319,448, Cl. 57-58.890.
Knemeyer, Friedel S., to General Electric Company. Brazing apparatus to manufacture composite compact components. 4,319,707, Cl. 228-46.000.
Knerich, Werner; Boehm, Udo; Schulze-Berge, Klaus; and Brotzler, Roland, to BASF Aktiengesellschaft. Pressure device for flexible recording media in cartridges using a universal joint mounting. 4,320,429, Cl. 360-130.340.
Knill, Robert B., to Goodyear Tire & Rubber Company, The. Pneumatic tire having axially varying tread composition. 4,319,620, Cl. 152-209.00R.
Knoll, Alois, to Centra-Burkle GmbH & Co., Firma. Automatic control system including a programmable memory with manually insertable jumpers. 4,320,310, Cl. 307-141.000.
Kobayashi, Akio: *See*—
Tajima, Masahiko; Sagisaka, Yasuo; Kondo, Toshio; and Kobayashi, Akio, 4,319,451, Cl. 60-274.000.
Kobayashi, Shigeharu: *See*—
Suzuki, Shigenobu; Hayashi, Kooichi; Hayashi, Chiaki; Takagi, Toshiyuki; and Kobayashi, Shigeharu, 4,319,435, Cl. 51-421.000.
Kobayashi, Sumio; Takahashi, Tadashi; Ino, Hidetoshi; and Sakai, Takami, to Tokyo Shibaura Denki Kabushiki Kaisha. Gate control circuit for thyristor converter. 4,320,445, Cl. 363-54.000.
Kobayashi, Takashi, to Yamaha Hatsudoki Kabushiki Kaisha. Steering mechanism for snow vehicles. 4,319,656, Cl. 180-182.000.
Kober AG: *See*—
Huber, Reinhold; and Koster, Waldemar, 4,319,855, Cl. 404-68.000.

Koblo, Jochen: *See*—
von dem Bussche, Gotz; and Koblo, Jochen, 4,319,826, Cl. 354-299.000.
Koci, Jaroslav: *See*—
Foltyn, Jan; Kuda, Vladimir; Vasicek, Vladimir; and Koci, Jaroslav, 4,319,611, Cl. 139-435.000.
Koci, Zdenek; and Schaub, Andres, to Ciba-Geigy Corporation. Process for printing or pad dyeing of textile material made from cellulose fibres, or from mixtures thereof with synthetic fibres. 4,319,881, Cl. 8-532.000.
Kodama, Yasuharu: *See*—
Takei, Yasuharu; Kodama, Yasuharu; Shimoda, Hiroshi; and Ohi, Satoshi, 4,320,139, Cl. 424-282.000.
Koe, Billie K., to Pfizer Inc. Composition for enhancing binding of a benzodiazepine to central benzodiazepine receptors and use thereof. 4,320,124, Cl. 424-244.000.
Koether, Bernard G. Primary thermostat using cooking computer temperature probe with control transfer upon probe failure. 4,320,285, Cl. 219-497.000.
Koga, Keiichiro; Yasuda, Yutaka; Saga, Ryokichi; and Takimoto, Yukio, to Kokusai Denshin Denwa Co., Ltd.; and Nippon Electric Co., Ltd. Method and device for conversion between a cyclic and a general code sequence by the use of dummy zero bit series. 4,320,511, Cl. 371-37.000.
Kogelschatz, Ulrich, to BBC Brown, Boveri & Company, Limited. Device for the production of ozone. 4,320,301, Cl. 422-186.180.
Kogure, Shigeru: *See*—
Momosaki, Eishi; Kogure, Shigeru; and Inoue, Minoru, 4,320,320, Cl. 310-361.000.
Kohga, Masayuki; and Taguchi, Shigemitsu, to Shoei Electric Co., Ltd. Method and apparatus for controlling current or power between interconnected power stations. 4,320,306, Cl. 307-51.000.
Kohl, Karl, to Sulzer Brothers Ltd. Raschel machine. 4,319,468, Cl. 66-203.000.
Kohno, Mitsuo: *See*—
Taguchi, Tadashi; Takemoto, Toshihide; Fujikawa, Noboru; and Kohno, Mitsuo, 4,320,189, Cl. 430-288.000.
Koizumi, Yutaka: *See*—
Sakamoto, Koji; Hayashi, Masayuki; Koizumi, Yutaka; and Tanzawa, Misao, 4,319,832, Cl. 355-15.000.
Kojima, Masao, to Shimano Industrial Company, Limited. Control device for a brake and a derailleur for a bicycle. 4,319,673, Cl. 192-4.00R.
Kojima, Tadashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Error data correcting system. 4,320,510, Cl. 371-37.000.
Kokubo, Fumiyuki. Apparatus for separating and conveying of animal house waste materials. 4,320,008, Cl. 210-527.000.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Koga, Keiichiro; Yasuda, Yutaka; Saga, Ryokichi; and Takimoto, Yukio, 4,320,511, Cl. 371-37.000.
Kollmann, Bernd: *See*—
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,319,736, Cl. 251-329.000.
Kollmorgen Technologies Corporation: *See*—
McCamy, Calvin S., 4,320,442, Cl. 362-301.000.
Kolthoff, C. Paul, to International Harvester Company. Fan. 4,319,866, Cl. 416-210.00R.
Komatsu, Yasuhiro; and Nagai, Michiko. Antitumor agent. 4,320,141, Cl. 424-284.000.
Kommandiittiyhtio Finnpipette Osmo A. Suovaniemi: *See*—
Suovaniemi, Osmo A.; Ekholm, Pertti; and Partanen, Paul, 4,319,841, Cl. 356-244.000.
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, to Canon Kabushiki Kaisha. Copying apparatus with a heated photosensitive drum. 4,319,828, Cl. 355-3.00R.
Komuro, Katsu; Hokari, Sadao; and Maeda, Yasuyuki, to Hitachi, Ltd. AC Elevator control system. 4,319,665, Cl. 187-29.00R.
Kondo, Jyunichi; Sensyu, Akira; Ono, Hidetaka; and Honda, Hiroki, to Mitsubishi Jukogyo Kabushiki Kaisha. Reaction vessel. 4,320,092, Cl. 422-224.000.
Kondo, Suzuhiko; and Yamada, Kei, to NGK Insulators, Ltd. Method and a device for inspecting bodies having a multiplicity of parallel channels extending therethrough. 4,319,840, Cl. 356-241.000.
Kondo, Takajiro; and Asamoto, Toshitaka, to Hitachi Metals, Ltd. Shearing device. 4,319,507, Cl. 83-694.000.
Kondo, Toshio: *See*—
Tajima, Masahiko; Sagisaka, Yasuo; Kondo, Toshio; and Kobayashi, Akio, 4,319,451, Cl. 60-274.000.
Konen, John C., to Rohm and Haas Company. Emulsion regenerant for ion exchange resins. 4,320,206, Cl. 521-26.000.
Konig, Klaus: *See*—
Schwindt, Jurgen; Meyborg, Holger; Reiff, Helmut; and Konig, Klaus, 4,320,068, Cl. 260-453.0AB.
Koninklijke Emballage Industrie Van Leer B.V.: *See*—
Tasseron, Frans A. W., 4,319,477, Cl. 72-352.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Okamoto, Syuzi, 4,319,741, Cl. 271-118.000.
Konrad, Charles E.: *See*—
Davis, Richard K.; and Konrad, Charles E., 4,320,334, Cl. 320-48.000.
Konstantinov, Boris A.: *See*—
Alexandrov, Vitaly V.; Bezlepkin, Anatoly I.; Konstantinov, Boris A.; Melnikova, Olga V.; Khomyak, Anatoly S.; Schukin, Lev I.; and Chukin, Marat S., 4,320,321, Cl. 313-209.000.
Kopicky, Edward E.: *See*—
McCarthy, Charles C.; Ackman, Mark E.; Dufek, Wayne L.; and Kopicky, Edward E., 4,320,388, Cl. 340-825.540.
Kopke, Helmut: *See*—
Motz, Herbert; Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Hartmann, Hans-Joerg; Frischmann, Harald; Falk, Roland; Hack, Joachim; Velic, Milan; and Kopke, Helmut, 4,320,171, Cl. 428-423.100.
Korbelak, Kenneth N.; and Masterson, Joseph B., to GK Technologies, Incorporated. Fiber organizer for splice cases and terminals. 4,319,951, Cl. 156-502.000.
Koshelev, Vladimir N.; Meshkov, Vyacheslav; and Chaplanov, Boris V. End-face seal for rotary internal-combustion engine. 4,319,867, Cl. 418-113.000.
Koskivirta, Veikko, to Valmet Oy. Method and apparatus for docking and undocking in lighter-aboard-ship vessels of the floater type. 4,319,540, Cl. 114-260.000.
Kosoczky, Iboly: *See*—
Benko, Pal; Messmer, Andras; Hajos, Gyorgy; Batori, Sandor; Petocz, Lujza; Kosoczky, Iboly; and Gorog, Peter, 4,320,127, Cl. 424-249.000.
Kosswig, Kurt: *See*—
Hentschel, Bernhard; Ziebarth, Jurgen; Coenen, Alfred; Kosswig, Kurt; and Praun, Ferdinand V., 4,320,106, Cl. 423-424.000.
Koster, Waldemar: *See*—
Huber, Reinhold; and Koster, Waldemar, 4,319,855, Cl. 404-68.000.
Koyama, Kazumi: *See*—
Fukushima, Toshitaka; Koyama, Kazumi; and Ueno, Kouji, 4,320,507, Cl. 371-21.000.
Kozai, Katsuya; Makino, Teruyoshi; and Kikuchi, Hisashi, to Fuji Photo Film Co., Ltd. Photographic film unit for diffusion transfer with a translucent mask sheet. 4,320,187, Cl. 430-207.000.
Kozima, Masatoshi; Tokieda, Akinori; Nagumo, Tadanobu; and Hirai, Masaru, to Yokohama Rubber Co., Ltd., The. Radial-ply tire having low rolling resistance. 4,319,619, Cl. 152-209.00R.
Kozlov, Sergei A.: *See*—
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonova, Grigory V., deceased; Samsonova, Nadezhda A., administrator; Samsonova, Natalya G., administrator; and Samsonova, Evgeny G., administrator, 4,319,715, Cl. 239-81.000.
Krause, Rudolf, to Rhewum - Rheinische Werkzeug- u. Maschinenfabrik GmbH. Large-capacity power screen. 4,319,993, Cl. 209-315.000.
Krauss, Geoffrey H. Fail-safe amplifier power supply. 4,320,447, Cl. 363-63.000.
Krauss-Maffei Aktiengesellschaft: *See*—
Hultsch, Gunther; and Wilkesmann, Helmut, 4,320,007, Cl. 210-376.000.
Kreikebaum, Gerhard: *See*—
Pellegrin, Michael T.; Kreikebaum, Gerhard; and Shofner, Frederick M., 4,319,901, Cl. 65-2.000.
Krendelev, Viktor N.: *See*—
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonova, Grigory V., deceased; Samsonova, Nadezhda A., administrator; Samsonova, Natalya G., administrator; and Samsonova, Evgeny G., administrator, 4,319,715, Cl. 239-81.000.
Krickau, Walter: *See*—
Schatton, Helmut; and Krickau, Walter, 4,319,970, Cl. 204-106.000.
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Meissen, Ralf; Loser, Friedrich; Berwix, Joachim; and Krischer, Christof, 4,320,395, Cl. 340-726.000.
Krishnan, Sivaram; Carter, Russell P., Jr.; and Kroshefsky, Robert D., to Mobay Chemical Corporation. Flame retarding agents for polycarbonates. 4,320,049, Cl. 524-94.000.
Krogseng, Gerald P.; Mandell, Joseph G.; and Ruth, George L., to Minnesota Mining and Manufacturing Company. Window structure including a sheet of polymeric film. 4,319,623, Cl. 160-90.000.
Kropp, Rudolf; Fischer, Martin; and Halbritter, Klaus, to BASF Aktiengesellschaft. Preparation of 5-(2,2,2-trihaloethyl)-dialkyl-tetrahydrofuran-2-ones. 4,320,062, Cl. 260-343.600.
Kroshefsky, Robert D.: *See*—
Krishnan, Sivaram; Carter, Russell P., Jr.; and Kroshefsky, Robert D., 4,320,049, Cl. 524-94.000.
Krug, Robert W.: *See*—
Alvarez, Joseph A., III; Bensadon, Joseph M.; Brennen, John F.; Brickman, Norman F.; and Krug, Robert W., 4,320,504, Cl. 370-104.000.
Kruger, Hermann, to Volkswagenwerk Aktiengesellschaft. Internal-combustion engine having two rows of cylinders. 4,319,548, Cl. 123-90.270.
Krupey, John: *See*—
Hirsch, Michael A.; Irvine, Douglas S.; and Krupey, John, 4,320,111, Cl. 424-12.000.
Kruse, John M.: *See*—
Wright, William H.; and Kruse, John M., 4,319,682, Cl. 206-180.000.
Kubota, Hidehiro: *See*—
Imai, Kazuhiro; Yamada, Shigemitsu; Kubota, Hidehiro; and Sakamaki, Jun, 4,319,883, Cl. 23-230.00B.
Kubota, Hitoshi, to Nissan Motor Co., Ltd. Tandem master cylinder with a liquid pressure control valve. 4,319,456, Cl. 60-562.000.

Kubota Ltd.: *See*—
Tomiyama, Muneo; Mizugane, Keiichi; Taniguchi, Kazunori; Nonaka, Toshio; and Oodoi, Hidenori, 4,319,698, Cl. 222-129.100.
Ujita, Tuginobu, 4,319,654, Cl. 180-155.000.

Kubota, Tetsumaru, to Olympus Optical Co., Ltd. Endoscope with a smoothly curved distal end face. 4,319,563, Cl. 128-6.000.

Kuboyama, Nobuyoshi. Heating process and its apparatus in reducing air pressure within a chamber at a balanced level. 4,319,408, Cl. 34-15.000.

Kuda, Vladimir: *See*—
Foltyn, Jan; Kuda, Vladimir; Vasicek, Vladimir; and Koci, Jaroslav, 4,319,611, Cl. 139-435.000.

Kudchadker, Mohan V.; and Whittington, Lawrence E., to Texaco Inc. Surfactant waterflood oil recovery process. 4,319,636, Cl. 166-274.000.

Kuenemund, Friedrich: *See*—
Volejnik, Wilhelm; Kuenemund, Friedrich; Traub, Karl; and Albsmeier, Hans, 4,320,366, Cl. 333-197.000.

Kuhn, John J., to American Standard Inc. Fail-safe and gate circuit. 4,320,315, Cl. 307-454.000.

Kulhanek, Antonin: *See*—
Porta, Augusto; Kulhanek, Antonin; Groult, Alain; and Tourrier, Herve ', 4,319,973, Cl. 204-133.000.

Kulprathipanja, Santi; and Neuzil, Richard W., to UOP Inc. Technique to reduce the zeolite molecular sieve solubility in an aqueous system. 4,319,928, Cl. 127-46.200.

Kurata, Masayuki: *See*—
Oka, Hiroyuki; Watanabe, Shingo; Watanabe, Yusyo; and Kurata, Masayuki, 4,319,670, Cl. 188-73.340.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Hisazumi, Nobuyuki; Funabashi, Shinichiro; and Sugeno, Katsuhiko, 4,320,175, Cl. 428-518.000.

Kurokawa, Takashi: *See*—
Oikawa, Shigeru; Katayama, Yuzo; Takato, Norio; and Kurokawa, Takashi, 4,320,292, Cl. 250-227.000.

Kurosawa, Masaji: *See*—
Yamamoto, Kyukichi; Kurosawa, Masaji; and Matsui, Taro, 4,320,202, Cl. 501-80.000.

Kurushima, Minoru; and Esaka, Akio, to Epoch Company, Ltd. Hammer game. 4,319,751, Cl. 273-85.00E.

Kydonieus, Agis F., to Herculite Protective Fabrics Corporation. Process for controlling cockroaches and other crawling insects. 4,320,113, Cl. 424-27.000.

Labadie, Paul A., to Farr Company. Air filter assembly including an improved jet pump cleaning apparatus. 4,319,897, Cl. 55-302.000.

Labbe, Francis A. M., to Molins Limited. Method and apparatus for perforating rod-like articles. 4,319,589, Cl. 131-281.000.

Lakshmanan, Pallavoor R.: *See*—
Acharya, Vikramkumar; and Lakshmanan, Pallavoor R., 4,320,211, Cl. 525-126.000.

Lambarelli, Livio: *See*—
Barberis, Giulio; Lambarelli, Livio; and Micca, Giorgio, 4,320,500, Cl. 370-60.000.

Lambertini, Giorgio; and Sala, Gianfranco, to SNIA VISCOSA Societa Nazionale Industria Applicazioni Viscosa S.p.A. Apparatus for the production of additive containing synthetic linear polymers. 4,319,848, Cl. 366-136.000.

Lammers, Henri T., to Akzo N.V. Process for the manufacture of fibres from poly-p-phenylene terephthalamide. 4,320,081, Cl. 264-184.000.

Lampert, Ernst, to Siemens Aktiengesellschaft. Electric circuit for the production of a number of different codes. 4,320,513, Cl. 375-1.000.

Landry, Lawrence J., Jr.: *See*—
Wilson, Darlene; Brown, Emmett J., Jr.; and Landry, Lawrence J., Jr., 4,319,884, Cl. 23-230.00R.

Lange, Harold T.; and Ziegler, Eugene J., to Sporlan Valve Company. Bidirectional flow filter-drier. 4,320,000, Cl. 210-117.000.

Lange, Richard M., to Lubrizol Corporation, The. Alkyl amino phenols and fuels and lubricants containing same. 4,320,020, Cl. 252-51.50R.

Lange, Richard M., to Lubrizol Corporation, The. Amino phenols useful as additives for fuels and lubricants. 4,320,021, Cl. 252-51.50R.

Langer, Heimo J.: *See*—
Gruber, Bruce A.; Langer, Heimo J.; and Dunnavant, William R., 4,320,218, Cl. 526-308.000.

Langford, Obie M.; and Richter, Albert P., Jr., to Texaco Inc. Cockcroft-Walton voltage multiplying circuit for slim hole well logging tool. 4,320,446, Cl. 363-59.000.

Lanting, Richard J.; and Munsey, Robert J., to Westinghouse Electric Corp. Air flow floor panel. 4,319,520, Cl. 98-37.000.

Lapp, John; Mason, Marco J.; Gauger, Gary A.; and Chai, Hui-Min, to McGraw-Edison Company. Electrical capacitor having an improved dielectric system. 4,320,034, Cl. 252-567.000.

Larsen, Darrell R., to Minneapolis Electric Steel Castings Company. Shell liner assembly for ore grinding mills. 4,319,719, Cl. 241-183.000.

Larsen, Mogens B.: *See*—
Christoffersen, Sten R.; Gregersen, Johan C.; and Larsen, Mogens B., 4,319,491, Cl. 73-662.000.

Larson, Gordon C.; and Coe, Richard A., to Babcock & Wilcox Company, The. Modular nuclear fuel assembly rack. 4,319,960, Cl. 376-272.000.

Larson, Richard T.; McMurtry, David H.; and Rinkleib, Helfried O., to International Business Machines Corporation. Rotary actuator for file protect function. 4,320,421, Cl. 360-60.000.

Larson, Willis A., to Oak Industries Inc. Connector for attaching an electrical component to a flat sheet. 4,320,272, Cl. 200-317.000.

Latimer, John P.; and Garland, Charles, to Deepsea Ventures, Inc. Dredgehead having forward water-deflecting means comprising two transverse elements. 4,319,414, Cl. 37-58.000.

Latimer, John P., to Deepsea Ventures, Inc. Means for controlling feed of particulate material into airlift pipe. 4,319,782, Cl. 299-1.000.

Lauckhardt, Gerhard; Fichtner, Rudi; and Broning, Manfred, to USM Corporation. Shoe lasting machine. 4,319,373, Cl. 12-8.300.

Lauer, Reinhard, to U.S. Philips Corporation. Piezoelectric fluid atomizer. 4,319,716, Cl. 239-102.000.

Laurel Bank Machine Co., Ltd.: *See*—
Furuya, Katusuke, 4,319,597, Cl. 133-8.00A.

Laurmann, Giselle V.: *See*—
Jeppson, Morris R., 4,319,856, Cl. 404-79.000.

Lausch, Henry N.: *See*—
Snavely, Benjamin H.; and Lausch, Henry N., 4,319,718, Cl. 241-101.200.

Law, Hung-Fai S.; and Lopez, Alexander D., to Bell Telephone Laboratories, Incorporated. Method for fabricating IGFET integrated circuits. 4,319,396, Cl. 29-571.000.

Law, William J. H., to AAL Enterprises, Inc. Troop carrier. 4,319,777, Cl. 296-64.000.

Lawson, John E., to Armco Inc. Fastener and devices in which load supporting members are secured thereby. 4,319,773, Cl. 285-137.00A.

Lea Manufacturing Company: *See*—
Millman, William G., 4,319,978, Cl. 204-301.000.

Le Boeuf, Guy. Liquid filter having refined vent valve. 4,320,001, Cl. 210-120.000.

Lechner, Robert, to Siemens Aktiengesellschaft. Circuit arrangement for determining the connection condition of a subscriber line in a telecommunications network. 4,320,260, Cl. 179-18.0FA.

Leclerc, Jean-Francois; Paret, Jacques; and Waegaert, Pierre, to Service d'Exploitation Industrialle des Tabacs et des Allumettes. Process for the layout of wrappers for cigars in a half-leaf of tobacco. 4,319,592, Cl. 131-365.000.

Leclerc, Pierre; Huignard, Jean-Pierre; Papuchon, Michel; and Puech, Claude, to Thomson-CSF. Monomodal optical fibre hydrophone operating by the elastooptical effect. 4,320,475, Cl. 367-149.000.

Le Dieu, Bernard; and Thiebaut, Georges, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Multiplex space switch. 4,320,501, Cl. 370-63.000.

Lee, Hsi L.: *See*—
Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., 4,320,056, Cl. 260-239.30T.

Lee, Kwang H. Toy grenade with delay-triggering mechanism. 4,319,426, Cl. 46-200.000.

Leehaug, David J.: *See*—
Nolen, Robert K.; and Leehaug, David J., 4,319,433, Cl. 51-170.0PT.

Legast, Etienne. Apparatus for the steam extraction of essential oils from vegetable material. 4,319,963, Cl. 202-170.000.

Leger, Gerard: *See*—
Chauvin, Yves; Gaillard, Jean; Leger, Gerard; and Van Landeghem, Hugo, 4,320,243, Cl. 585-521.000.

Lehmann, Rudiger, to Dual Gebruder Steidinger GmbH & Co. Switch device for a turntable. 4,320,494, Cl. 369-225.000.

Lehn, Rudolf; and Hintsch, Otto, to Sulzer Brothers Ltd. Pattern mechanism for a warp knitting machine. 4,319,469, Cl. 66-207.000.

Lehner, August: *See*—
Motz, Herbert; Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Hartmann, Hans-Joerg; Frischmann, Harald; Falk, Roland; Hack, Joachim; Velic, Milan; and Kopke, Helmut, 4,320,171, Cl. 428-423.100.

Leininger, Lyle E.: *See*—
Streit Philip N.; and Leininger, Lyle E., 4,319,762, Cl. 280-79.200.

Leiter, Heinz; and Plog, Rudi, to Merit-Werk Merten & Co. KG. Switch for combined heater plug or ignition and starting circuits in a motor vehicle. 4,320,266, Cl. 200-4.000.

Lembke, Russell B.: *See*—
Anderson, Hugh C.; Doyle, James E.; and Lembke, Russell B., 4,320,042, Cl. 523-144.000.

Leonard, Larry W.; and Shikler, Arie, to Fleetwood Enterprises, Inc. Cab-over motorhome bed structure. 4,319,778, Cl. 296-166.000.

Leonhart, Xaver F. Adjustable lawn chair with separate footrest. 4,319,779, Cl. 297-19.000.

Les Fils d'Auguste Scheuchzer, S.A.: *See*—
Scheuchzer, Fredy; and Buhler, Fritz, 4,319,416, Cl. 37-104.000.

Lesher, Dale L.: *See*—
Brown, Richard A.; Fixman, Myles; and Lesher, Dale L., 4,320,097, Cl. 423-63.000.

Leuchtag, H. Richard. Nuclear waste disposal system. 4,320,028, Cl. 252-628.000.

Lewis, David O.: *See*—
Heise, Nyles N.; Hoffman, Roy L.; Kiss, Istvan S.; Lewis, David O.; Pertzborn, James J.; and Robinson, Thomas S., 4,320,456, Cl. 364-200.000.

Leybold Heraeus GmbH: *See*—
Thomas, Friedrich W., 4,320,305, Cl. 307-6.000.

Libbey-Owens-Ford Company: *See*—
Gruesbeck, Thomas L., 4,319,999, Cl. 210-95.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Reiss, Willi, 4,320,275, Cl. 219-10.55B.
Thiele, Karl-Heinz, 4,320,263, Cl. 179-115.5VC.

Lichtenberg, Heinz D., to Dresser Industries, Inc. Apparatus for measuring magnetic flux density resulting from galvanic current flow in subsurface casing using a plurality of flux gates. 4,320,340, Cl. 324-221.000.

Lien, Wayne W., to RTE Corporation. High current under oil expulsion fuse. 4,320,375, Cl. 337-204.000.
Liggett Group Inc.: *See—*
Kallianos, Andrew G.; and Southwick, Everett W., 4,319,585, Cl. 131-275.000.
Light, Richard D. Golf club carrier. 4,319,616, Cl. 150-1.50C.
Lillig, Donald J.: *See—*
Bugler, Thomas W., III; Lillig, Donald J.; Brown, Thomas L.; and Kinney, Ohler L., Jr., 4,320,073, Cl. 261-112.000.
Lin, Robert I.: *See—*
Hilton, Barney W.; Lin, Robert I.; and Topor, Michael G., 4,320,009, Cl. 210-651.000.
Lindemann, Klaus; Rode, Konrad; and Petersen, Erwin, to WABCO Fahrzeugbremsen GmbH. Process and apparatus for controlling the braking pressure in anti-skid motor vehicle brake systems. 4,320,459, Cl. 364-426.000.
Lindenfelser, Jerome W., to Photo Control Corporation. Reflex shutter. 4,319,819, Cl. 354-154.000.
Lindmayer, Joseph, to Solarex Corporation. Method of forming semicrystalline silicon article and product produced thereby. 4,320,168, Cl. 428-332.000.
Lindner, Alfred: *See—*
Volkamer, Klaus; Lindner, Alfred; Merger, Franz; Wagner, Ulrich; Brunner, Erwin; Sandrock, Gerhard; and Strohmeyer, Max, 4,320,232, Cl. 568-697.000.
Linn, Bruce O.: *See—*
Fisher, Michael H.; and Linn, Bruce O., 4,320,129, Cl. 424-251.000.
Lion Corporation: *See—*
Yoshikawa, Susumu, 4,320,033, Cl. 252-547.000.
Lipkins, Morton S. Adjustable hollow retroflector. 4,319,804, Cl. 350-102.000.
Lippert, Irving S.: *See—*
Carter, Stephen W.; Friedman, Harvey S.; and Lippert, Irving S., 4,319,827, Cl. 354-304.000.
Lippincott, Richard L., Sr. Toilet additive dispenser. 4,319,369, Cl. 4-228.000.
Liquipak International, Inc.: *See—*
McCaleb, David E., 4,319,517, Cl. 92-128.000.
Liston, Novell D., to Eaton Corporation. Fire fighting apparatus for a storage/retrieval machine. 4,319,662, Cl. 182-13.000.
Lithium Corporation of America: *See—*
Nelli, Joseph R.; Bowers, Johnney G.; and Conway, Eustace R., 4,320,105, Cl. 423-421.000.
Litovitz, Theodore A.: *See—*
Macedo, Pedro B.; and Litovitz, Theodore A., 4,319,905, Cl. 65-31.000.
Littelfuse, Inc.: *See—*
Bukala, Alexander E., 4,320,369, Cl. 335-202.000.
Littmann, Martin F.: *See—*
Dahlstrom, Norris A.; and Littmann, Martin F., 4,319,936, Cl. 148-111.000.
Liu, Ping Y., to General Electric Co. Ternary polycarbonate compositions containing polyacrylate and thermoplastic polyester. 4,320,212, Cl. 525-148.000.
Ljung, Hans G., to Aktiebolaget Electrolux. Refrigerated display chest. 4,319,463, Cl. 62-256.000.
Lo, Jau-Lin. Tripod assembly. 4,319,729, Cl. 248-188.700.
Lobeck, Walter G., Jr.: *See—*
Temple, Davis L., Jr.; Yevich, Joseph P.; and Lobeck, Walter G., Jr., 4,320,131, Cl. 424-267.000.
Lockheed Electronics Co., Inc.: *See—*
Rawicz, Harris C., 4,320,287, Cl. 235-412.000.
Loferski, Joseph J.: *See—*
Narasimhan, Mandayam C.; Roessler, Barton; and Loferski, Joseph J., 4,320,251, Cl. 136-256.000.
Lohman, Frederick H., to Procter & Gamble Company, The. Fabric conditioning compositions. 4,320,013, Cl. 252-8.800.
Lomerson, Robert B. Mechanical bonding of surface conductive layers. 4,319,708, Cl. 228-111.000.
Lonchamp, Daniel: *See—*
Rebeller, Michel; Yout, Pierre; and Lonchamp, Daniel, 4,320,050, Cl. 260-112.00R.
Lonza Inc.: *See—*
Schaeufele, Peter J., 4,320,147, Cl. 424-329.000.
Lopez, Alexander D.: *See—*
Law, Hung-Fai S.; and Lopez, Alexander D., 4,319,396, Cl. 29-571.000.
Lopez, John A., to Shell Oil Company. Storage-stable precatalyzed polyepoxide compositions. 4,320,222, Cl. 528-89.000.
Lorenz, Donald H.: *See—*
Tu, Shu-Tung; and Lorenz, Donald H., 4,319,811, Cl. 351-166.000.
Lorusso, Simone: *See—*
Cecere, Mirella; Gozzo, Franco; Lorusso, Simone; and Garavaglia, Carlo, 4,320,132, Cl. 424-269.000.
Loser, Friedrich: *See—*
Meissen, Ralf; Loser, Friedrich; Berwix, Joachim; and Krischer, Christof, 4,320,395, Cl. 340-726.000.
Lostak, Charles: *See—*
Sznopek, John L.; Lostak, Charles; Heisler, Robert W.; Ferraro, Joseph P.; and Kazienko, Henry J., 4,319,950, Cl. 156-475.000.
Love, Richard F.; Dorawala, Tansukhlal G.; and Kerr, Edwin R., to Texaco Inc. Steam dehydrocyclization of paraffinic hydrocarbons in the presence of catalyst containing Group VIII metal and an activating amount of a Group I B metal. 4,320,240, Cl. 585-419.000.
Lubrizol Corporation, The: *See—*
Hayashi, Katsumi, 4,320,019, Cl. 252-51.50A.
Lange, Richard M., 4,320,020, Cl. 252-51.50R.
Lange, Richard M., 4,320,021, Cl. 252-51.50R.
Lucas Industries Limited: *See—*
Brearley, Malcolm; and Adamson, John, 4,320,460, Cl. 364-426.000.
Lucia, Louis V. Wave action power plant. 4,319,454, Cl. 60-506.000.
Lumbroso, Sylvain J., to Jaeger. Fault detector for vehicle brake lights. 4,320,383, Cl. 340-71.000.
Lund, Clarence A.; Barron, Edward W.; Holstin, Howard E.; and Sugino, Michael D., to Motorola, Inc. Method of making self-aligned device. 4,319,395, Cl. 29-571.000.
Lund, Roger E.; and Wirick, Michael P., to Hughes Aircraft Company. High speed laser pulse analyzer. 4,320,462, Cl. 364-525.000.
Lupke, Gerd P. H.; and Lupke, Manfred A. A. Apparatus for producing thermoplastic tubing. 4,319,872, Cl. 425-532.000.
Lupke, Manfred A. A.: *See—*
Lupke, Gerd P. H.; and Lupke, Manfred A. A., 4,319,872, Cl. 425-532.000.
Lurix, Paul, to Keyline Research & Development Corporation. Distillate fuel additives. 4,319,887, Cl. 44-72.000.
Lutes, Charles L., to Sperry Corporation. Method and apparatus for balancing the magnetic field detecting loops of a cryogenic gradiometer using trimming coils and superconducting disks. 4,320,341, Cl. 324-248.000.
M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Fischer, Hermann, 4,319,525, Cl. 101-350.000.
Macdonald, David I., to Western Electric Company, Inc. Recovery of gold from an etching solution. 4,319,922, Cl. 75-108.000.
Macdonald, David I.: *See—*
Falanga, Bruno J.; and Macdonald, David I., 4,319,923, Cl. 75-108.000.
Macedo, Pedro B.; and Litovitz, Theodore A. Method of leaching glass preforms. 4,319,905, Cl. 65-31.000.
Macfarlane, Richard O., to Windrush Nominees Pty. Ltd. Kickup rudder assembly having roller detent. 4,319,538, Cl. 114-165.000.
Machanian, William V., to Wurlitzer Company, The. Sequence generator for an electronic musical instrument. 4,319,509, Cl. 84-1.030.
Machinefabriek G. J. Nijhuis B.V.: *See—*
Nijhuis, Johan W., 4,319,383, Cl. 17-1.00E.
Mackey, Charles P. Apparatus for printing leather products. 4,319,523, Cl. 101-3.00R.
Mackworth-Young, Robin. Tuning aid for tuning musical instruments. 4,319,515, Cl. 84-454.000.
Maeda, Hidetoshi; Inoue, Kazuo; and Someno, Noboru, to Sharp Kabushiki Kaisha; and Sony Corp. Frequency counting apparatus. 4,320,529, Cl. 455-158.000.
Maeda, Yasuyuki: *See—*
Komuro, Katsu; Hokari, Sadao; and Maeda, Yasuyuki, 4,319,665, Cl. 187-29.00R.
Magendans, Frederik; Te Raa, Gerhardus A.; and van Rheenen, Bernhard J., to U.S. Philips Corporation. Method of improving the heat radiation properties of an X-ray tube rotary anode and a rotary anode thus obtained. 4,320,323, Cl. 313-330.000.
Magidson, Mark, to Moldex/Metric Products, Inc. Disposable face mask. 4,319,567, Cl. 128-206.190.
Mahncke, Jurgen, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Device for folding the spans of a bridge for transport on a vehicle. 4,319,375, Cl. 14-2.400.
Maierhofer, Max, to Air Filter Corporation. Louver grease filter. 4,319,898, Cl. 55-322.000.
Mail-Ex Corporation: *See—*
Russell, Robert J., 4,319,444, Cl. 53-569.000.
Makino, Teruyoshi: *See—*
Kozai, Katsuya; Makino, Teruyoshi; and Kikuchi, Hisashi, 4,320,187, Cl. 430-207.000.
Makovec, Donald J.; and Hann, Paul D., to Phillips Petroleum Company. Dialkyl ether production. 4,320,233, Cl. 568-697.000.
Mallett, John H., to Singer Company, The. Instrumentation devices using synchro-resolver drive circuitry. 4,320,391, Cl. 340-347.0SY.
Mandell, Joseph G.: *See—*
Krogseng, Gerald P.; Mandell, Joseph G.; and Ruth, George L., 4,319,623, Cl. 160-90.000.
Mann, Arnold: *See—*
Collomia, Harald; Mann, Arnold; and Haub, Martin, 4,319,658, Cl. 180-271.000.
Mann, Gamdur S., to General Motors Corporation. Diesel exhaust particulate and organic vapor emission control. 4,319,453, Cl. 60-309.000.
Mann, James H. Golf ball teeing machine. 4,319,753, Cl. 273-201.000.
Manoliu, Juliana: *See—*
Walker, Laurence G.; Sansbury, James D.; Rung, Jr.; and Manoliu, Juliana, 4,320,312, Cl. 307-238.800.
Manville Service Corporation: *See—*
Sznopek, John L.; Lostak, Charles; Heisler, Robert W.; Ferraro, Joseph P.; and Kazienko, Henry J., 4,319,950, Cl. 156-475.000.
Marchioro, Ignazio, to Escher Wyss Limited. Controlled deflection roll. 4,319,389, Cl. 29-116.0AD.
Marchioro, Ignazio; and Stotz, Wolf-Gunter, to Escher Wyss Limited. Rolling mill for rolling web-like materials. 4,319,522, Cl. 100-162.00B.
Marchou, Jacques R., to Societe en nom collectif dite: Calmettes, Marchou & Cie. Fastening device of the clamp type. 4,319,385, Cl. 24-20.00R.
Marcinkiewicz, Eugene J., to GSE, Inc. Retorque measuring apparatus. 4,319,494, Cl. 73-862.230.
Marconi Instruments Limited: *See—*
Kikkert, Cornelis J., 4,320,361, Cl. 332-16.00R.

Marei, Abdel H.: *See*—
Balsley, Richard B.; and Marei, Abdel H., 4,320,130, Cl. 424-251.000.
Maremont Corporation: *See*—
Nolen, Robert K.; and Leehaug, David J., 4,319,433, Cl. 51-170.0PT.
Margraf, Adolf. Cooler for hot smoke-laden gases. 4,319,631, Cl. 165-76.000.
Maric, Dane: *See*—
Tarrson, Emanuel B.; and Maric, Dane, 4,319,377, Cl. 15-111.000.
Mariella, Raymond P., Jr., to Allied Chemical Corporation. Isotope separation by solar photoionization. 4,320,300, Cl. 250-423.00P.
Marine Electric Corporation: *See*—
Ingram, Maxwell, 4,320,343, Cl. 324-450.000.
Mark, Victor; and Hedges, Charles V., to General Electric Company. Process for purifying crude diphenols. 4,320,234, Cl. 568-724.000.
Marlboro Marketing, Inc.: *See*—
Wahl, Michael, 4,319,688, Cl. 211-175.000.
Marley Company, The: *See*—
Bugler, Thomas W., III; Lillig, Donald J.; Brown, Thomas L.; and Kinney, Ohler L., Jr., 4,320,073, Cl. 261-112.000.
Marquardt Corporation, The: *See*—
Buford, William H., Jr.; and Wagner, John J., 4,320,298, Cl. 250-358.00R.
Marr, Andrew W., Jr., to GKJ, Inc. Oil recovery well paraffin elimination means. 4,319,632, Cl. 166-60.000.
Marsh, R. Claude, to Pure Air Corporation. Air handling system for laminar flow clean enclosure. 4,319,899, Cl. 55-416.000.
Martin, Armand: *See*—
Dunham, Philip N.; Martin, Armand; and Peck, Gregory G. A., 4,319,524, Cl. 101-128.000.
Martin, Gregory W., to Carrier Corporation. Tube end expander and method of operating the same. 4,319,472, Cl. 72-122.000.
Martin Marietta Corp.: *See*—
Papazian, Harold A.; and Howerton, Murlin T., 4,319,626, Cl. 165-1.000.
Papazian, Harold A.; and Howerton, Murlin T., 4,319,627, Cl. 165-1.000.
Martin, Roy W.: *See*—
Colley, Peter S.; and Martin, Roy W., 4,319,580, Cl. 128-661.000.
Martin, William T. Chassis gaging system. 4,319,402, Cl. 33-180.0AT.
Marui Industry Co., Ltd.: *See*—
Takeguchi, Masanobu; and Oyobe, Isao, 4,320,085, Cl. 422-24.000.
Marumo, Toshio: *See*—
Horii, Horoshi; Itou, Masao; Matsumoto, Hidenosuke; and Marumo, Toshio, 4,320,316, Cl. 307-595.000.
Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Moisture control method and means for pavements and bridge deck constructions. 4,319,854, Cl. 404-28.000.
Masaki, Takeharu: *See*—
Morihara, Kazuyuki; Oka, Tatsushi; Soejima, Masami; and Masaki, Takeharu, 4,320,197, Cl. 435-70.000.
Mashimo, Yukio: *See*—
Iura, Yukio; Yamamichi, Masayoshi; Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, 4,319,814, Cl. 354-33.000.
Mason, Marco J.: *See*—
Lapp, John; Mason, Marco J.; Gauger, Gary A.; and Chai, Hui-Min, 4,320,034, Cl. 252-567.000.
Massachusetts Institute of Technology: *See*—
Gatos, Harry C.; and Chi, Jim-Yong, 4,320,247, Cl. 136-255.000.
Masterson, Joseph B.: *See*—
Korbelak, Kenneth N.; and Masterson, Joseph B., 4,319,951, Cl. 156-502.000.
Mathews, Herbert H.: *See*—
Henry, David W.; and Mathews, Herbert H., 4,319,846, Cl. 356-401.000.
Matsuda, Toshio: *See*—
Ueno, Ryuzo; Kanayama, Tatsuo; Matsuda, Toshio; Tomiyasu, Kunihiko; and Inamine, Shigeo, 4,320,153, Cl. 426-643.000.
Matsui, Masao; and Naito, Hiroshi, to Kanebo, Ltd. Cleaning device in a copying machine. 4,319,831, Cl. 355-15.000.
Matsui, Taro: *See*—
Yamamoto, Kyukichi; Kurosawa, Masaji; and Matsui, Taro, 4,320,202, Cl. 501-80.000.
Matsumoto, Hidenosuke: *See*—
Horii, Horoshi; Itou, Masao; Matsumoto, Hidenosuke; and Marumo, Toshio, 4,320,316, Cl. 307-595.000.
Matsumoto, Mutsumi; and Wada, Kouichi, to Nippon Kayaku Kabushiki Kaisha. Process for producing methacrolein and methacrylic acid. 4,320,227, Cl. 562-534.000.
Matsumoto, Seiji: *See*—
Ishida, Masamitsu; Kato, Hisatoyo; and Matsumoto, Seiji, 4,320,296, Cl. 250-327.100.
Matsumoto, Shoji: *See*—
Kato, Mamoru; Matsumoto, Shoji; and Aizawa, Tatsuo, 4,320,186, Cl. 430-98.000.
Matsushiro, Yukimitsu, to K.K. Matsushiro. Retractable headlights for radio-controlled toy vehicles. 4,320,441, Cl. 362-65.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Horii, Horoshi; Itou, Masao; Matsumoto, Hidenosuke; and Marumo, Toshio, 4,320,316, Cl. 307-595.000.
Kiuchi, Mitsuyuki, 4,320,273, Cl. 219-10.49R.
Terada, Jiro; and Nitta, Tsuneharu, 4,319,485, Cl. 73-336.000.
Matsushita, Hajime: *See*—
Ojima, Katsuhiro; Matsushita, Hajime; Fujimoto, Isao; Mizuno, Satosi; and Nishida, Tsuyoshi, 4,319,542, Cl. 118-100.000.
Mattil, Klaus, to Pruf-und Forschungsinstitut fur die Schuhherstellung. Seam construction, particularly for heel portions of shoes and method of effecting the same. 4,319,413, Cl. 36-57.000.
Mauthe, Gerhard: *See*—
Hartmann, Hans; and Mauthe, Gerhard, 4,320,337, Cl. 323-358.000.
Mayerbock, Gottfried; Strobl, Rupert; and Seiler, Sebastian, to Vereinigte Edelstahlwerke Aktiengesellschaft. Cutter head for suction dredges. 4,319,415, Cl. 37-67.000.
McAlister, Roy E. Apparatus for extruding a thermoplastic material. 4,319,871, Cl. 425-376.00R.
McCaleb, David E., to Liquipak International, Inc. Piston filler. 4,319,517, Cl. 92-128.000.
McCall, Francis J. Electrical pulse acupressure system. 4,319,584, Cl. 128-789.000.
McCamy, Calvin S., to Kollmorgen Technologies Corporation. Annular illuminator. 4,320,442, Cl. 362-301.000.
McCarthy, Charles C.; Ackman, Mark E.; Dufek, Wayne L.; and Kopicky, Edward E., to Westinghouse Electric Corp. Two wire optical data communication system. 4,320,388, Cl. 340-825.540.
McCarthy, David M.: *See*—
Riggs, Dean D.; and McCarthy, David M., 4,319,674, Cl. 194-4.00R.
McDonald, Henry S., to Bell Telephone Laboratories, Incorporated. Arrangement for requesting service for called telephone subscribers. 4,320,258, Cl. 179-18.00B.
McDonald, John F.; Scarton, Henry A.; Kennedy, Warren C.; and Crilly, Paul B., to Rensselaer Polytechnic Institute. Microprocessor based arc-air and welder noise abatement controller. 4,320,282, Cl. 219-137.0PS.
McGlothlin, Quentin T.: *See*—
Shaw, Donald L.; McGlothlin, Quentin T.; O'Brien, Barry M.; Keck, John W.; and Freyberger, Wilfred L., 4,319,987, Cl. 209-166.000.
McGraw-Edison Company: *See*—
Bushnell, Joseph H., 4,320,436, Cl. 361-128.000.
Lapp, John; Mason, Marco J.; Gauger, Gary A.; and Chai, Hui-Min, 4,320,034, Cl. 252-567.000.
Shaw, J. Howard, 4,320,377, Cl. 337-278.000.
McIntyre, Robert N.: *See*—
Holman, James R.; and McIntyre, Robert N., 4,320,252, Cl. 174-21.00R.
McMahan, Michael E.; Jackson, Gerald D.; and Barrington, Burchus Q., to Halliburton Services. Drill pipe tester and safety valve. 4,319,633, Cl. 166-250.000.
McMahan, Michael E.; and Barrington, Burchus Q., to Halliburton Services. Drill pipe tester valve. 4,319,634, Cl. 166-250.000.
McMinn, Derek J. W. Device for inclusion in an immobilizing structure for a limb and limb immobilizing structures including such devices. 4,319,565, Cl. 128-87.00R.
McMurtry, David H.: *See*—
Larson, Richard T.; McMurtry, David H.; and Rinkleib, Helfried O., 4,320,421, Cl. 360-60.000.
McWhorter, Edward M. Reciprocating engine. 4,319,498, Cl. 74-595.000.
Mead Johnson & Company: *See*—
Temple, Davis L., Jr.; Yevich, Joseph P.; and Lobeck, Walter G., Jr., 4,320,131, Cl. 424-267.000.
Measurex Corporation: *See*—
Howarth, John J., 4,319,847, Cl. 356-431.000.
Mechanical Technology Incorporated: *See*—
Hoogenboom, Leo, 4,319,606, Cl. 137-625.300.
Meise, Guenther: *See*—
Gross, Friedrich; Meise, Guenther; and Unger, Herbert, 4,319,457, Cl. 60-593.000.
Meisenburg, Ewald; and Keim, Karl-Heinz. Method of processing oil-shale or tar sand. 4,319,982, Cl. 208-11.00R.
Meissen, Ralf; Loser, Friedrich; Berwix, Joachim; and Krischer, Christof, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Alpha-numeric-display system with selectable crawl. 4,320,395, Cl. 340-726.000.
Melnikova, Olga V.: *See*—
Alexandrov, Vitaly V.; Bezlepkin, Anatoly I.; Konstantinov, Boris A.; Melnikova, Olga V.; Khomyak, Anatoly S.; Schukin, Lev I.; and Chukin, Marat S., 4,320,321, Cl. 313-209.000.
Melvin, Morton A. Dual grate for burning wood and coal. 4,319,555, Cl. 126-60.000.
Memorex Mini Disc Drive Corporation: *See*—
Hall, Robert C., 4,320,425, Cl. 360-97.000.
Vogt, Noland E., 4,320,430, Cl. 360-133.000.
Menard, Jacques, to Preciform Inc. Sliding closure assembly. 4,319,430, Cl. 49-404.000.
Menashi, Jameel; Rappas, Alkis S.; and Douglas, Donald A., to Cabot Corporation. Partitioning of refractory metals from oxidation resistant scrap alloy. 4,320,094, Cl. 423-56.000.
Merck & Co., Inc.: *See*—
Fisher, Michael H.; and Linn, Bruce O., 4,320,129, Cl. 424-251.000.
Merger, Franz; and Nestler, Gerhard, to BASF Aktiengesellschaft. Preparation of 1-(aralkyl)-2-naphthols. 4,320,235, Cl. 568-736.000.
Merger, Franz: *See*—
Volkamer, Klaus; Lindner, Alfred; Merger, Franz; Wagner, Ulrich; Brunner, Erwin; Sandrock, Gerhard; and Strohmeyer, Max, 4,320,232, Cl. 568-697.000.
Merit-Werk Merten & Co. KG: *See*—
Leiter, Heinz; and Plog, Rudi, 4,320,266, Cl. 200-4.000.

Merrick, Thomas B.: *See*—
Baun, Philip J., Jr.; and Merrick, Thomas B., 4,320,505, Cl. 370-110.000.
Merz, Theodore P.: *See*—
Riemersma, Coenraad E.; and Merz, Theodore P., 4,319,868, Cl. 425-290.000.
Merz, William J. Weed and grass removing tool. 4,319,642, Cl. 172-13.000.
Meshkov, Vyacheslav: *See*—
Koshelev, Vladimir N.; Meshkov, Vyacheslav; and Chaplanov, Boris V., 4,319,867, Cl. 418-113.000.
Messmer, Andras: *See*—
Benko, Pal; Messmer, Andras; Hajos, Gyorgy; Batori, Sandor; Petocz, Lujza; Kosoczky, Iboly; and Gorog, Peter, 4,320,127, Cl. 424-249.000.
Metal Extraction Processes Corporation: *See*—
Good, Dallis L.; and Good, David L., 4,319,971, Cl. 204-109.000.
Mette, Manfred, to Ortmann & Herbst GmbH. Valve arrangement for filling containers with gas-containing liquid. 4,319,613, Cl. 141-39.000.
Meuschke, Robert E.; and Vandriak, Walter J., to Westinghouse Electric Corp. Apparatus for vertically tubing a heat exchanger. 4,319,725, Cl. 248-68.00R.
Meyborg, Holger: *See*—
Schwindt, Jurgen; Meyborg, Holger; Reiff, Helmut; and Konig, Klaus, 4,320,068, Cl. 260-453.0AB.
Meyer, Artur: *See*—
Piesch, Steffen; Engelhardt, Friedrich; Wille, Herbert; Weidemuller, Wolf; and Meyer, Artur, 4,320,060, Cl. 260-317.000.
Meyer, Klaus, to Hoechst Aktiengesellschaft. Gelated micronutrient fertilizers, process for their manufacture and their use for plant fertilization. 4,319,910, Cl. 71-27.000.
Meyhall Chemical A.G.: *See*—
Tiefenthaler, Karl H. O.; and Wyss, Ulrich, 4,320,226, Cl. 536-114.000.
Micca, Giorgio: *See*—
Barberis, Giulio; Lambarelli, Livio; and Micca, Giorgio, 4,320,500, Cl. 370-60.000.
Michaud, Roger P.; and Campbell, Douglas B., deceased (by Campbell, Diane, administratrix), to American Stabilis, Inc. Flame detection and proof control device. 4,319,873, Cl. 431-24.000.
Micro-Acoustics Corporation: *See*—
Dieter, Norman H., Jr.; and Drelinger, Sanford, 4,320,492, Cl. 369-170.000.
Microdry Corportion: *See*—
Jeppson, Morris R., 4,319,856, Cl. 404-79.000.
Middleton, Nancy D.: *See*—
Goldfarb, Adolph E.; and Middleton, Nancy D., 4,319,424, Cl. 46-12.000.
Midwestern Industries, Inc.: *See*—
Crone, William J., Jr.; and Wright, John P., 4,319,991, Cl. 209-255.000.
Davis, William F.; and Tsutsumi, Masataka, 4,319,992, Cl. 209-275.000.
Mikajiri, Kiichiro, to Yugen Kaisha Shinnihon Seisakusho. Shaped frame material for use in forming pit frames. 4,319,438, Cl. 52-221.000.
Miles, James A.: *See*—
Grabiak, Raymond C.; and Miles, James A., 4,319,913, Cl. 71-86.000.
Miller, Jean C.; and Thompson, Gerald L., to Eli Lilly and Company. 20'-Hydroxyvinblastine and related compounds. 4,320,058, Cl. 260-244.400.
Millman, William G., to Lea Manufacturing Company. Spacer for electrodialysis stack. 4,319,978, Cl. 204-301.000.
Mills, Thomas O. Method for notching pallets. 4,319,931, Cl. 144-326.00R.
Mineral Recovery Corporation: *See*—
Haight, William J., 4,319,995, Cl. 209-481.000.
Ministry of International Trade and Industry: *See*—
Nozaki, Ken, 4,320,180, Cl. 429-20.000.
Ojima, Katsuhiro; Matsushita, Hajime; Fujimoto, Isao; Mizuno, Satosi; and Nishida, Tsuyoshi, 4,319,542, Cl. 118-100.000.
Minneapolis Electric Steel Castings Company: *See*—
Larsen, Darrell R., 4,319,719, Cl. 241-183.000.
Minnear, William P.; and Morrison, William A., to General Electric Company. Method for making shaped carbon fiber structures. 4,320,079, Cl. 264-102.000.
Minnesota Mining and Manufacturing Company: *See*—
Engel, Michael R.; and Aasen, Linda L., 4,320,149, Cl. 424-331.000.
Krogseng, Gerald P.; Mandell, Joseph G.; and Ruth, George L., 4,319,623, Cl. 160-90.000.
Ulseth, John W., 4,319,740, Cl. 271-22.000.
Ulseth, John W., 4,319,742, Cl. 271-118.000.
Mishima, Toshio: *See*—
Kato, Hiroshi; and Mishima, Toshio, 4,319,511, Cl. 84-1.220.
Mita Industrial Company Limited: *See*—
Kato, Mamoru; Matsumoto, Shoji; and Aizawa, Tatsuo, 4,320,186, Cl. 430-98.000.
Mitco Corporation: *See*—
Gorchev, Dimiter; Ingard, Karl U.; and Willke, Herbert L., Jr., 4,319,521, Cl. 98-38.00E.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Sugimoto, Hidehiko, 4,320,332, Cl. 318-798.000.
Mitsubishi Gas Chemical Co., Inc.: *See*—
Takematsu, Tetsuo; and Tsuchiya, Hideshi, 4,319,915, Cl. 71-92.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Kondo, Jyunichi; Sensyu, Akira; Ono, Hidetaka; and Honda, Hiroki, 4,320,092, Cl. 422-224.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Morishita, Sadao; Okumura, Fumio; Higuchi, Masahiro; Miyauchi, Masahiro; and Kamei, Syun, 4,320,039, Cl. 525-54.420.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Abe, Katsuhiro; Tsuruoka, Mitsuo; Kiriyama, Shigeki; and Nakamori, Kazunobu, 4,320,041, Cl. 524-503.000.
Mitsubishi Rayon Company, Limited: *See*—
Sato, Hiroshi; Shigeta, Sadaaki; and Takenaka, Yasuo, 4,320,011, Cl. 210-694.000.
Mitsuhashi, Hiroshi; Mizuno, Den-ichi; Hayashi, Koji; Abe, Shigeru; Takase, Muneaki; and Narita, Toshiharu, to Zenyaku Kogyo Kabushiki Kaisha. Extracts of *Marsdenia cundurango Reichenbach fil.* 4,320,120, Cl. 424-182.000.
Mitsuhashi, Hiroshi: *See*—
Mizuno, Den-ichi; Mitsuhashi, Hiroshi; Abe, Shigeru; and Hayashi, Koji, 4,320,119, Cl. 424-182.000.
Mitsui Coke Co. Ltd.: *See*—
Oyabu, Mikio; Fukuda, Kenji; and Hirata, Keiichi, 4,320,107, Cl. 423-447.600.
Mittelhauser, Bernhard. Plug-in connector for use with electrical sockets in motor vehicles. 4,319,798, Cl. 339-154.00R.
Miyaji, Yoshimori; Fujiki, Hirokazu; and Takahashi, Fumio, to Tokyo Shibaura Denki Kabushiki Kaisha. Adjusting device for color television camera apparatus. 4,320,414, Cl. 358-51.000.
Miyake, Haruhisa: *See*—
Asawa, Tatsuro; Miyake, Haruhisa; and Yamashita, Masami, 4,320,205, Cl. 521-38.000.
Miyakozawa, Keiji: *See*—
Otake, Yukio; Kikuchi, Yuji; Nakanishi, Tsuneo; and Miyakozawa, Keiji, 4,319,505, Cl. 83-295.000.
Miyamoto, Koichi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,319,828, Cl. 355-3.00R.
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Morishita, Sadao; Okumura, Fumio; Higuchi, Masahiro; Miyauchi, Masahiro; and Kamei, Syun, 4,320,039, Cl. 525-54.420.
Mizugane, Keiichi: *See*—
Tomiyama, Muneo; Mizugane, Keiichi; Taniguchi, Kazunori; Nonaka, Toshio; and Oodoi, Hidenori, 4,319,698, Cl. 222-129.100.
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Mizuno, Den-ichi: *See*—
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Mizuno, Satosi: *See*—
Ojima, Katsuhiro; Matsushita, Hajime; Fujimoto, Isao; Mizuno, Satosi; and Nishida, Tsuyoshi, 4,319,542, Cl. 118-100.000.
Mizusako, Masahiro: *See*—
Harayama, Hiroshi; Shinkai, Ken; Takahashi, Hiroshi; and Mizusako, Masahiro, 4,320,214, Cl. 525-264.000.
Mizushima, Yoshihiko: *See*—
Yoshikawa, Akira; Ochi, Osamu; Hisaki, Tomoko; and Mizushima, Yoshihiko, 4,320,191, Cl. 430-296.000.
Mobay Chemical Corporation: *See*—
Krishnan, Sivaram; Carter, Russell P., Jr.; and Kroshefsky, Robert D., 4,320,049, Cl. 524-94.000.
Moberg, Sigurd M., to E. J. Brooks Company. Seal. 4,319,776, Cl. 292-322.000.
Modern Engineering Company, Inc.: *See*—
Bird, Robert E., 4,319,604, Cl. 137-498.000.
Moen, Alfred M., to Stanadyne, Inc. Faucet valves. 4,319,735, Cl. 251-175.000.
Moldex/Metric Products, Inc.: *See*—
Magidson, Mark, 4,319,567, Cl. 128-206.190.
Molinder, Per: *See*—
Akerstrom, Bengt; and Molinder, Per, 4,319,837, Cl. 355-73.000.
Molins Limited: *See*—
Labbe, Francis A. M., 4,319,589, Cl. 131-281.000.
Molnlycke AB: *See*—
Widlund, Leif U. R.; and Ternstrom, Maj I., 4,319,572, Cl. 128-284.000.
Momosaki, Eishi; Kogure, Shigeru; and Inoue, Minoru, to Kabushiki Kaisha Suwa Seikosha. Coupled mode tuning fork type quartz crystal vibrator. 4,320,320, Cl. 310-361.000.
Momose, Denichi: *See*—
Iizuka, Kinji; Akahane, Kenji; Kamijo, Yukio; Momose, Denichi; and Ajisawa, Yukiyoshi, 4,320,134, Cl. 424-273.00R.
Monarch Marking Systems, Inc.: *See*—
Seeley, William J., 4,320,158, Cl. 428-42.000.
Moncur, Marlowe V.: *See*—
Woodbrey, James C.; and Moncur, Marlowe V., 4,320,213, Cl. 525-179.000.
Mongelluzzo, Philip A.: *See*—
Frawley, William J.; and Mongelluzzo, Philip A., 4,320,469, Cl. 367-33.000.
Monsanto Company: *See*—
Coran, Aubert Y.; and Patel, Raman, 4,320,173, Cl. 428-457.000.
Grabiak, Raymond C.; and Miles, James A., 4,319,913, Cl. 71-86.000.

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Monta, Kazuo; and Takigawa, Yukio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of supervising the channel stability in reactor cores of nuclear reactors. 4,319,959, Cl. 376-245.000.

Montedison S.p.A.: *See*—
Cecere, Mirella; Gozzo, Franco; Lorusso, Simone; and Garavaglia, Carlo, 4,320,132, Cl. 424-269.000.

Montross, Edwin A., to Western Geophysical Co. of America. Method for testing a seismic marine cable. 4,320,468, Cl. 367-13.000.

Moog, John F., to Innovative Enterprises, Inc. Pallet having runners with displaceable sections. 4,319,530, Cl. 108-51.300.

Mookherjee, Braja D.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Granda, Edward J.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,319,586, Cl. 131-276.000.

Moran, Thomas F. Method and apparatus for heating lengths of thermoplastic material. 4,320,077, Cl. 264-40.600.

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Suzuki, Seigo; Eguchi, Seiji; and Moriya, Yoshiaki, 4,320,454, Cl. 364-200.000.

Morley, John S.: *See*—
Dutta, Anand S.; Gormley, James J.; Hayward, Christopher F.; Morley, John S.; and Stacey, Gilbert J., 4,320,117, Cl. 424-177.000.

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Hobbs, Larry P.; Morris, Harold D.; and Voelker, Scott F., 4,319,488, Cl. 73-509.000.

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Minnear, William P.; and Morrison, William A., 4,320,079, Cl. 264-102.000.

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Birchall, James D.; and Morton, Michael J., 4,320,074, Cl. 264-8.000.

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Daniels, Richard G.; Walton, Richard S.; and Yamanouchi, Roy K., 4,320,478, Cl. 368-69.000.
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Lund, Clarence A.; Barron, Edward W.; Holstin, Howard E.; and Sugino, Michael D., 4,319,395, Cl. 29-571.000.
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Motz, Herbert; Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Hartmann, Hans-Joerg; Frischmann, Harald; Falk, Roland; Hack, Joachim; Velic, Milan; and Kopke, Helmut, to BASF Aktiengesellschaft. Magnetic recording media containing elastomeric polyurethane binders in the magnetic coating. 4,320,171, Cl. 428-423.100.

Moulene, Jean-Louis; and Bouvot, Jean-Francois, to Societe Anonyme Francaise Du Ferodo. Device for setting a valve. 4,319,714, Cl. 236-99.00G.

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Okabe, Takayuki; Mukai, Kunio; and Hirano, Masachika, 4,320,126, Cl. 424-249.000.

Mullen, Richard J., to Chief Industries, Inc. Vacuum check bowl. 4,319,602, Cl. 137-202.000.

Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, to Thyssen Industrie AG. Apparatus and method for manufacturing a metal casing particularly for gate valves used in nuclear reactors and the like, having a large nominal width and a casing manufactured in accordance with the method. 4,319,736, Cl. 251-329.000.

Muller, Roberto; and Sousa, Antonio M., to Pony International, Inc. Shoe having fluid pressure supporting means. 4,319,412, Cl. 36-29.000.

Muller, Roman, to Gebrueder Buehler AG. Apparatus for the dry cleaning of grain. 4,319,990, Cl. 209-240.000.

Munroe, Ronald G. AC Switch mechanism of the ball contact type. 4,320,271, Cl. 200-277.000.

Munsey, Robert J.: *See*—
Lanting, Richard J.; and Munsey, Robert J., 4,319,520, Cl. 98-37.000.

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Ueda, Yutaka, 4,319,720, Cl. 242-35.50R.

Murata Manufacturing Co., Ltd.: *See*—
Sakamoto, Yukio; Arakawa, Yoshio; and Takahashi, Seiichi, 4,320,364, Cl. 333-167.000.

Murata, Shinji; Torigai, Akiyoshi; Morikawa, Teruo; Nakaoka, Masaki; and Sone, Yoshiaki, to Canon Kabushiki Kaisha. Optical device of a copying apparatus. 4,319,836, Cl. 355-55.000.

Murayama, Osamu, to Sony Corporation. Tape recorder having cassette loading apparatus. 4,320,424, Cl. 360-96.500.

Murphy, Clarence R.: *See*—
Kim, Jin K.; Murphy, Clarence R.; and Smith, Edward W., 4,320,210, Cl. 525-57.000.

Murphy, Gerald J., to Union Carbide Corporation. Aqueous solutions of dialdehydes and ketones. 4,320,231, Cl. 568-494.000.

Murphy, John A. Roofing shingle assembly having solar capabilities. 4,319,437, Cl. 52-220.000.

Murphy, Walter T.; and Guiley, Clifford D., Jr., to B. F. Goodrich Company, The. Curable thixotropic epoxy/amine terminated liquid polymer compositions. 4,320,047, Cl. 523-457.000.

Murski, Kenneth J., to Philip A. Hunt Chemical Corp. Ammoniacal alkaline cupric etchant solution for and method of reducing etchant undercut. 4,319,955, Cl. 156-659.100.

Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Granda, Edward J.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Uses of hexenol derivatives in augementing or enhancing the aroma or taste of smoking tobacco compositions and smoking tobacco articles. 4,319,586, Cl. 131-276.000.

Myers, Dewey R., to Texas Instruments Incorporated. Address sequence mechanism for reordering data continuously over some interval using a single memory structure. 4,320,466, Cl. 364-900.000.

Mynatt, Roy L. Fiber production from continuous cultivation of microorganisms. 4,320,198, Cl. 435-101.000.

Nagai, Michiko: *See*—
Komatsu, Yasuhiro; and Nagai, Michiko, 4,320,141, Cl. 424-284.000.

Nagase, Tsuneyuki: *See*—
Fujita, Fumio; Kitamura, Shuji; Tamura, Toshifumi; and Nagase, Tsuneyuki, 4,320,040, Cl. 524-459.000.

Nagato, Shoin; Takagi, Nobuo; and Obara, Heitara, to Kaken Chemical Co., Ltd. Herbicidal composition. 4,319,919, Cl. 71-124.000.

Nagel, Hartmut; Zimmermann, Hans; Pieper, Fritz; and Plage, Dieter, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Jogger for the lateral alignment of sheets in sheet deliverers. 4,319,744, Cl. 271-222.000.

Nagle, Eugene M.: *See*—
Dischert, Robert A.; Nagle, Eugene M.; and Williams, James J., Jr., 4,320,416, Cl. 358-133.000.

Nagumo, Tadanobu: *See*—
Kozima, Masatoshi; Tokieda, Akinori; Nagumo, Tadanobu; and Hirai, Masaru, 4,319,619, Cl. 152-209.00R.

Nagy, Ernest J.: *See*—
Gutridge, Jack E.; and Nagy, Ernest J., 4,319,528, Cl. 105-397.000.

Nahma AG: *See*—
Frey, Ernst; and Aregger, Alois, 4,320,423, Cl. 360-72.200.

Naito, Hiroshi: *See*—
Matsui, Masao; and Naito, Hiroshi, 4,319,831, Cl. 355-15.000.

Nakahara, Hiromi: *See*—
Ogawa, Hiroshi; Nakahara, Hiromi; and Tamai, Yasuo, 4,320,159, Cl. 428-64.000.

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Abe, Katsuhiro; Tsuruoka, Mitsuo; Kiriyama, Shigeki; and Nakamori, Kazunobu, 4,320,041, Cl. 524-503.000.

Nakamura, Akito, to Toray Silicone Company, Ltd. Self-extinguishing silicone rubber containing aluminum hydrate. 4,320,044, Cl. 524-413.000.
Nakamura, Robert M.: *See*—
Wolf, Walter; Nakamura, Robert M.; Gokce, Ata; Tubis, Manuel; and O'Brien, Timothy J., 4,320,109, Cl. 424-1.000.
Nakanishi, Tsuneo: *See*—
Otake, Yukio; Kikuchi, Yuji; Nakanishi, Tsuneo; and Miyakozawa, Keiji, 4,319,505, Cl. 83-295.000.
Nakao, Hideyuki, to Kabushiki Kaisha Daini Seikosha. Switch for an electronic timepiece. 4,320,482, Cl. 368-201.000.
Nakaoka, Masaki: *See*—
Murata, Shinji; Torigai, Akiyoshi; Morikawa, Teruo; Nakaoka, Masaki; and Sone, Yoshiaki, 4,319,836, Cl. 355-55.000.
Nalco Chemical Company: *See*—
Kemmer, Frank N., 4,319,895, Cl. 55-73.000.
Narancic, Vojislav; and Braunovic, Milenko, to Kearney-National (Canada) Limited. Electric fuses employing composite aluminum and cadmium fuse elements. 4,320,374, Cl. 337-162.000.
Narasimhan, Mandayam C.; Roessler, Barton; and Loferski, Joseph J., to Solamat Inc. Ohmic contacts for solar cells by arc plasma spraying. 4,320,251, Cl. 136-256.000.
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Mitsuhashi, Hiroshi; Mizuno, Den-ichi; Hayashi, Koji; Abe, Shigeru; Takase, Muneaki; and Narita, Toshiharu, 4,320,120, Cl. 424-182.000.
National Research Development Corporation: *See*—
Bateman, James E.; and Connolly, John F., 4,320,299, Cl. 250-374.000.
Jones, Robin, 4,320,415, Cl. 358-105.000.
National Semiconductor Corporation: *See*—
Balakrishnan, Ramanatha V.; and Fowler, William R., 4,320,521, Cl. 375-36.000.
Navone, Lorenzo, to Ing. C. Olivetti & C., S.p.A. Copying machine with original carriage moving device. 4,319,835, Cl. 355-50.000.
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Cartmell, James V., 4,319,579, Cl. 128-640.000.
Nehrbass, Joel M.; and Dorzok, Gary J. Refuse receptacle with renewable liners. 4,319,694, Cl. 220-407.000.
Neitz, Paul D. Toe stop and roller skate combination. 4,319,759, Cl. 280-11.200.
Nelli, Joseph R.; Bowers, Johnney G.; and Conway, Eustace R., to Lithium Corporation of America. Pellitizing method. 4,320,105, Cl. 423-421.000.
Nemoto, Hideyuki: *See*—
Tanabe, Masanori; Shimada, Satoshi; Yasukawa, Akio; Nemoto, Hideyuki; Nishihara, Motohisa; Tsuchiya, Masatoshi; and Soeno, Ko, 4,319,397, Cl. 29-589.000.
Nertman, Inge L.: *See*—
Backman, Erik E.; Henrekson, Ulf A.; and Nertman, Inge L., 4,319,684, Cl. 206-464.000.
Neser, Willem J.: *See*—
Willers, Albertus V. Z.; and Neser, Willem J., 4,319,699, Cl. 222-175.000.
Nestler, Gerhard: *See*—
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Nestor, John J.: *See*—
White, Abraham, deceased; Nestor, John J.; Jones, Gordon H.; and Burton, Pamela M., 4,320,118, Cl. 424-177.000.
Neuman, Richard F.: *See*—
Johnson, Roger R.; Kleinhagen, Charles W., Jr.; Neuman, Richard F.; and Winckler, Peter S., 4,319,668, Cl. 188-72.400.
Neuzil, Richard W.: *See*—
Kulprathipanja, Santi; and Neuzil, Richard W., 4,319,928, Cl. 127-46.200.
New Environment Energy Development Aktiebolag (NEED): *See*—
Karlsson, Jan; and Raimel, Gert, 4,320,304, Cl. 290-55.000.
New Hermes Incorporated: *See*—
Schimmel, Norbert, 4,319,417, Cl. 40-10.00R.
Newsbaum, Robert W.: *See*—
Cristobal, Fely B.; and Newsbaum, Robert W., 4,320,026, Cl. 252-139.000.
Newton, Robert B. Camera and flash unit support. 4,319,825, Cl. 354-293.000.
NGK Insulators, Ltd.: *See*—
Kondo, Suzuhiko; and Yamada, Kei, 4,319,840, Cl. 356-241.000.
Nicco, Adrien, to Societe Chimique des Charbonnages-CDF Chimie. Process and apparatus for widening the polyethylene molecular weight distribution by using two reactors and two separators. 4,320,088, Cl. 422-134.000.
Nichias Corporation: *See*—
Yamamoto, Kyukichi; Kurosawa, Masaji; and Matsui, Taro, 4,320,202, Cl. 501-80.000.
Nicholas, William R. Metal-alloy thermoelectric characteristic analyzer. 4,320,344, Cl. 324-451.000.
Nicholson, Terence P. Ring seal. 4,319,758, Cl. 277-205.000.
Nicolas, Maurice; and Bacconnet, Eugene, to Commissariat a l'Energie Atomique; and Bfg Glassgroup. Mirror composite elements. 4,320,164, Cl. 428-167.000.
Nicolas, Pierre. Rotary screen for receiving optical images particularly advertising images. 4,319,805, Cl. 350-120.000.
Nielson, Jay P. Self-propelled slip form method. 4,320,075, Cl. 264-32.000.
Niemeyer, Lutz; and Ragaller, Klaus, to BBC Brown, Boveri & Company, Ltd. Blasting charge for a blast actuated high-voltage power switch. 4,319,527, Cl. 102-314.000.
Nies, James: *See*—
Sullivan, George; and Nies, James, 4,319,541, Cl. 116-318.000.
Nijhuis, Johan W., to Machinefabriek G. J. Nijhuis B.V. Apparatus for electrically stunning animals to be slaughtered. 4,319,383, Cl. 17-1.00E.
Nippon Electric Co., Ltd.: *See*—
Koga, Keiichiro; Yasuda, Yutaka; Saga, Ryokichi; and Takimoto, Yukio, 4,320,511, Cl. 371-37.000.
Sasaki, Yutaka, 4,320,353, Cl. 330-286.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Matsumoto, Mutsumi; and Wada, Kouichi, 4,320,227, Cl. 562-534.000.
Nippon Kogaku K.K.: *See*—
Mori, Ikuo, 4,319,810, Cl. 350-469.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Taira, Tadaaki; Hirabayashi, Kiyoteru; Ichinose, Hiroyuki; Hirano, Osamu; and Suzuki, Motoaki, 4,320,277, Cl. 219-61.000.
Nippon Soken, Inc.: *See*—
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,319,480, Cl. 73-35.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Horikawa, Izumi; and Shinji, Masaaki, 4,320,523, Cl. 375-103.000.
Oikawa, Shigeru; Katayama, Yuzo; Takato, Norio; and Kurokawa, Takashi, 4,320,292, Cl. 250-227.000.
Yoshikawa, Akira; Ochi, Osamu; Hisaki, Tomoko; and Mizushima, Yoshihiko, 4,320,191, Cl. 430-296.000.
Nippondenso Co., Ltd.: *See*—
Ishii, Yoshiya; Fujitani, Nobuyuki; and Dohshita, Hidetoshi, 4,319,550, Cl. 123-198.0DB.
Tajima, Masahiko; Sagisaka, Yasuo; Kondo, Toshio; and Kobayashi, Akio, 4,319,451, Cl. 60-274.000.
Nishida, Tsuyoshi: *See*—
Ojima, Katsuhiro; Matsushita, Hajime; Fujimoto, Isao; Mizuno, Satosi; and Nishida, Tsuyoshi, 4,319,542, Cl. 118-100.000.
Nishihara, Motohisa: *See*—
Tanabe, Masanori; Shimada, Satoshi; Yasukawa, Akio; Nemoto, Hideyuki; Nishihara, Motohisa; Tsuchiya, Masatoshi; and Soeno, Ko, 4,319,397, Cl. 29-589.000.
Nishikubo, Yasuhiko: *See*—
Sekine, Mitsuo; and Nishikubo, Yasuhiko, 4,320,479, Cl. 368-74.000.
Nishimura, Akira; and Nishimura, Kyuichiro, to Toray Industries, Inc. Fabric structure for fiber reinforced plastics. 4,320,160, Cl. 428-107.000.
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Nishimura, Akira; and Nishimura, Kyuichiro, 4,320,160, Cl. 428-107.000.
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, to Semiconductor Research Foundation. GaAs Semiconductor device. 4,320,410, Cl. 357-43.000.
Nissan Motor Company: *See*—
Yoneda, Kenji; Sanezawa, Fumio; Takagi, Yasuo; and Ushijima, Yuji, 4,319,549, Cl. 123-198.00E.
Nissan Motor Co., Ltd.: *See*—
Kubota, Hitoshi, 4,319,456, Cl. 60-562.000.
Morita, Hideo; and Iwasa, Yoshio, 4,319,452, Cl. 60-293.000.
Otani, Shuichi; Kato, Shinichi; Hashimoto, Susumu; and Itoh, Kyohichi, 4,319,797, Cl. 339-75.00R.
Yanaga, Norihide, 4,319,496, Cl. 74-473.00R.
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Horner, Michael; Irgang, Matthias; and Nissen, Axel, 4,320,228, Cl. 568-459.000.
Nitta, Tsuneharu: *See*—
Terada, Jiro; and Nitta, Tsuneharu, 4,319,485, Cl. 73-336.000.
Nogami, Tomoyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Brake pressure control device of deceleration responsive type. 4,319,786, Cl. 303-6.00C.
Noguchi, Sadao: *See*—
Hojo, Hiroshi; and Noguchi, Sadao, 4,319,879, Cl. 8-128.00R.
Nolen, Robert K.; and Leehaug, David J., to Maremont Corporation. Tool for cutting automotive components. 4,319,433, Cl. 51-170.0PT.
Nomura, Kazuhiko, to Yamaha Hatsudoki Kabushiki Kaisha. Air intake conduitry for a motorcycle. 4,319,657, Cl. 180-219.000.
Nonaka, Toshio: *See*—
Tomiyama, Muneo; Mizugane, Keiichi; Taniguchi, Kazunori; Nonaka, Toshio; and Oodoi, Hidenori, 4,319,698, Cl. 222-129.100.
Nordson Corporation: *See*—
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Northern Telecom, Inc.: *See*—
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Northern Telecom Limited: *See*—
Read, Clifford D., 4,320,262, Cl. 179-103.000.
Norton Company: *See*—
Weaver, Gerald Q., 4,320,204, Cl. 501-91.000.
Norton, Richard V.; and Howe, Steven C., to Ashland Oil, Inc. High density turbine fuel. 4,320,238, Cl. 585-14.000.
Norusis, Philip T.: *See*—
Black, James F.; Courtney, Richard A.; Grudkowski, Thomas W.; Norusis, Philip T.; and Wood, Harry R., 4,320,365, Cl. 333-187.000.
Novak, Raymond F.: *See*—
Geist, Bernard W.; and Novak, Raymond F., 4,319,705, Cl. 227-120.000.
Nowakowski, Peter M.; Boberski, William G.; and Seiner, Jerome A., to PPG Industries, Inc. Curable silicate compositions containing con-

densed phosphate hardeners and pH controlling bases. 4,319,926, Cl. 106-74.000.

Nozaki, Ken, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Fuel cell. 4,320,180, Cl. 429-20.000.

NTN Toyo Bearing Company, Ltd.: *See*—
Ito, Akihiko; and Saeki, Noriaki, 4,319,465, Cl. 64-21.000.
Yoshioka, Morihisa, 4,319,478, Cl. 72 306.000.

Null, Michael W.; Bethards, Charles W.; and Burzynski, William A., to Motorola, Inc. Radio with audio controls and associated displays. 4,320,255, Cl. 179-1.00G.

Nussbaum, Hans, to Otto Nussbaum G.m.b.H. & Co. KG, Fertigungstechnik und Maschinenbau. Lifting mechanisms especially lifting platform. 4,319,738, Cl. 254-89.00R.

Oak Industries Inc.: *See*—
Larson, Willis A., 4,320,272, Cl. 200-317.000.

Oakes, James J.; and Scheithauer, William, Jr., to GTE Products Corporation. Intimate mixtures of refractory metal carbides and a binder metal. 4,320,156, Cl. 427-213.000.

Obara, Heitara: *See*—
Nagato, Shoin; Takagi, Nobuo; and Obara, Heitara, 4,319,919, Cl. 71-124.000.

O'Brien, Barry M.: *See*—
Shaw, Donald L.; McGlothlin, Quentin T.; O'Brien, Barry M.; Keck, John W.; and Freyberger, Wilfred L., 4,319,987, Cl. 209-166.000.

O'Brien, Timothy J.: *See*—
Wolf, Walter; Nakamura, Robert M.; Gokce, Ata; Tubis, Manuel; and O'Brien, Timothy J., 4,320,109, Cl. 424-1.000.

Occidental Research Corporation: *See*—
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Oce-Nederland B.V.: *See*—
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Ochi, Osamu: *See*—
Yoshikawa, Akira; Ochi, Osamu; Hisaki, Tomoko; and Mizushima, Yoshihiko, 4,320,191, Cl. 430-296.000.

Oda, Yoshio; Morimoto, Takeshi; and Suzuki, Kohji, to Asahi Glass Company, Ltd. Aqueous alkali metal chloride electrolytic cell. 4,319,969, Cl. 204-98.000.

Odnolko, Mikhail V.: *See*—
Bank, Mikhail U.; Prozorov, Valery I.; Rubichev, Nikolai A.; Odnolko, Mikhail V.; Rozenberg, Evgeny A.; Bessonov, Alexei F.; Berezjuk, Iraida K.; and Guzikov, Sergei D., 4,320,532, Cl. 455-226.000.

Oeser, Heinz-Guenter: *See*—
Theobald, Hans; Adolphi, Heinrich; Eicken, Karl; and Oeser, Heinz-Guenter, 4,320,122, Cl. 424-200.000.

Ogawa, Hiroshi; Nakahara, Hiromi; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,320,159, Cl. 428-64.000.

Ogura, Masaru: *See*—
Hashimoto, Yohei; Ogura, Masaru; and Ishizone, Hiroyuki, 4,320,225, Cl. 536-4.000.

Ohi, Satoshi: *See*—
Takei, Yasuharu; Kodama, Yasuharu; Shimoda, Hiroshi; and Ohi, Satoshi, 4,320,139, Cl. 424-282.000.

Ohira, Masuhiro: *See*—
Iuchi, Munenori; Iseki, Tsutomu; Takeyama, Yoshinori; and Ohira, Masuhiro, 4,319,622, Cl. 152-362.00R.

Ohlendorf, Heinrich-Wilhelm; Wolf, Klaus-Ullrich; Kaupmann, Wilhelm; and Heinemann, Henning, to Kali-Chemie Pharma GmbH. 2,3,4,5-Tetrahydro-1-benzoxepin-3,5-dione derivatives. 4,320,061, Cl. 260-333.000.

Ohmi, Tadahiro: *See*—
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,320,410, Cl. 357-43.000.

Oikawa, Shigeru; Katayama, Yuzo; Takato, Norio; and Kurokawa, Takashi, to Nippon Telegraph and Telephone Public Corporation. Coordinate input apparatus. 4,320,292, Cl. 250-227.000.

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Oka, Hiroyuki; Watanabe, Shingo; Watanabe, Yusyo; and Kurata, Masayuki, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Akebono Brake Industry Company Limited. Mechanism for preventing dropping of the caliper during work on a pin-slide type disc brake. 4,319,670, Cl. 188-73.340.

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Rathbun, Donald J.; and O'Keefe, David B., 4,320,465, Cl. 364-900.000.

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Ueno, Atsuyuki; and Yokota, Junichiro, 4,319,968, Cl. 204-96.000.

Okuda, Yukio; Katayama, Naohiro; and Izumi, Tosio, to Sawafuji Electric Co., Ltd. Vibrating compressor. 4,320,448, Cl. 363-134.000.

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Morishita, Sadao; Okumura, Fumio; Higuchi, Masahiro; Miyauchi, Masahiro; and Kamei, Syun, 4,320,039, Cl. 525-54.420.

Olin Corporation: *See*—
Kindlmann, Peter J.; Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., 4,319,625, Cl. 164-467.000.

Olivier, Paul D., to Garrett Corporation, The. Gear ratio indicator. 4,320,381, Cl. 340-52.00F.

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Benteler, Hubertus; Hansen, Rainer; Olszewski, Egon; and Wecker, Ferdinand, 4,319,471, Cl. 72-59.000.

Olympus Optical Co., Ltd.: *See*—
Kubota, Tetsumaru, 4,319,563, Cl. 128-6.000.

Onischak, Michael: *See*—
Anderson, Gerald L.; Onischak, Michael; and Rush, William F., 4,319,891, Cl. 55-15.000.

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Kondo, Jyunichi; Sensyu, Akira; Ono, Hidetaka; and Honda, Hiroki, 4,320,092, Cl. 422-224.000.

Ono Pharmaceutical Co., Ltd.: *See*—
Iizuka, Kinji; Akahane, Kenji; Kamijo, Yukio; Momose, Denichi; and Ajisawa, Yukiyoshi, 4,320,134, Cl. 424-273.00R.

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Oodoi, Hidenori: *See*—
Tomiyama, Muneo; Mizugane, Keiichi; Taniguchi, Kazunori; Nonaka, Toshio; and Oodoi, Hidenori, 4,319,698, Cl. 222-129.100.

Ooka, Isami; and Hisazumi, Yosinori, to Osaka Gas Company, Ltd. System for generation of electricity by utilization of heat exchange between liquefied natural gas and intermediate heat medium. 4,320,303, Cl. 290-1.00R.

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Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,319,480, Cl. 73-35.000.

Opitz, Konrad; and Schickfluss, Rudolf, to Hoechst Aktiengesellschaft. Monoazo dyestuff being stable under dyeing conditions; its manufacture and its use. 4,319,880, Cl. 8-526.000.

Oriental Motor Co., Ltd.: *See*—
Fukuzawa, Koji; and Kawaguchi, Hideo, 4,319,398, Cl. 29-598.000.

Orser, Garry D., Sr. Tossing game. 4,319,755, Cl. 273-401.000.

Ortmann & Herbst GmbH: *See*—
Mette, Manfred, 4,319,613, Cl. 141-39.000.

Osada, Yoshihito; Bell, Alexis T.; and Shen, Mitchel M., to University of California, The Regents of the. Polymerization or inorganic element-containing monomers using plasma, and the formed product. 4,320,219, Cl. 528-4.0AD.

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Ooka, Isami; and Hisazumi, Yosinori, 4,320,303, Cl. 290-1.00R.

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Yonezawa, Kazuya; and Osawa, Tadashi, 4,320,215, Cl. 526-62.000.

Osborne, Edward L., to Westvaco Corporation. Reinforced end sealed container. 4,319,710, Cl. 229-33.000.

Ostrowski, John C.; and Staller, Norman D., to Polaroid Corporation. Auto/manual focus control inhibit/override. 4,319,820, Cl. 354-187.000.

Otake, Yukio; Kikuchi, Yuji; Nakanishi, Tsuneo; and Miyakozawa, Keiji, to Hitachi, Ltd. Pendulum-type flying shear. 4,319,505, Cl. 83-295.000.

Otani, Shuichi; Kato, Shinichi; Hashimoto, Susumu; and Itoh, Kyohichi, to Nissan Motor Company, Limited. Electrical connector with terminal locking means. 4,319,797, Cl. 339-75.00R.

Otsuki, Tsuguo: *See*—
Suzuki, Shinjiro; Yoshikawa, Tadashi; Otsuki, Tsuguo; Takeda, Masao; Kamoi, Nobuhisa; and Satoh, Kazuo, 4,320,348, Cl. 330-52.000.

Otto Nussbaum G.m.b.H. & Co. KG, Fertigungstechnik und Maschinenbau: *See*—
Nussbaum, Hans, 4,319,738, Cl. 254-89.00R.

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Takeuchi, Takashi; Kaneko, Yoichi; and Owatari, Hisato, 4,320,276, Cl. 219-10.810.

Owen, Gwilym, to Owens-Corning Fiberglas Corporation. Polyester-based molding compositions. 4,320,045, Cl. 523-523.000.

Owens-Corning Fiberglas Corporation: *See*—
Bennett, Joe B., 4,319,775, Cl. 285-383.000.
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, 4,319,903, Cl. 65-27.000.
Marzocchi, Alfred, 4,319,854, Cl. 404-28.000.
Owen, Gwilym, 4,320,045, Cl. 523-523.000.
Pellegrin, Michael T.; Kreikebaum, Gerhard; and Shofner, Frederick M., 4,319,901, Cl. 65-2.000.

Owens-Illinois, Inc.: *See*—
Pei, Yu K., 4,319,561, Cl. 126-452.000.

Oyabu, Mikio; Fukuda, Kenji; and Hirata, Keiichi, to Mitsui Coke Co. Ltd. Process for producing carbon fibers. 4,320,107, Cl. 423-447.600.

Oyobe, Isao: *See*—
Takeguchi, Masanobu; and Oyobe, Isao, 4,320,085, Cl. 422-24.000.

P. H. Jones Hydrogeology, Inc.: *See*—
Jones, Paul H., 4,319,635, Cl. 166-263.000.

Pacholski, Jan: *See*—
Jozwicki, Ryszard; Kluska, Bogdan; Radom, Czeslaw; and Pacholski, Jan, 4,319,448, Cl. 57-58.890.

Pafford, Bernie J.: *See*—
Waghorne, Robert H.; Gernand, Martin O.; and Pafford, Bernie J., 4,319,892, Cl. 55-60.000.
Pagani, Giorgio, to Snamprogetti S.p.A. Flexible integrated method for the production of ammonia and urea. 4,320,103, Cl. 423-359.000.
Paioni, Romeo, to Ciba-Geigy Corporation. Derivatives of perhydroaza-heterocycles. 4,320,137, Cl. 424-274.000.
Palm, Gordon F.; and Hartig, R. George. Neutralization of phosphoric acid waste waters. 4,320,012, Cl. 210-713.000.
Pampouchidis, Georgios, to Vianova Kunstharz, A.G. Cathodically depositable coating compositions and process for same. 4,320,220, Cl. 524-591.000.
Panaro, Robert J.; Robbins, Richard W.; and Smith, Charles F. Stress relieving weld joint for composite fusible element. 4,320,376, Cl. 337-252.000.
Pandrol Limited: *See*—
Cutts, Glynn D., 4,319,392, Cl. 29-402.080.
Papazian, Harold A.; and Howerton, Murlin T., to Martin Marietta Corp. Chemical storage of energy. 4,319,626, Cl. 165-1.000.
Papazian, Harold A.; and Howerton, Murlin T., to Martin Marietta Corp. Chemical storage of energy. 4,319,627, Cl. 165-1.000.
Papuchon, Michel: *See*—
Leclerc, Pierre; Huignard, Jean-Pierre; Papuchon, Michel; and Puech, Claude, 4,320,475, Cl. 367-149.000.
Paret, Jacques: *See*—
Leclerc, Jean-Francois; Paret, Jacques; and Waegaert, Pierre, 4,319,592, Cl. 131-365.000.
Parker, Donald K. Combination toilet article. 4,319,594, Cl. 132-11.00R.
Parker, Sidney A. Barometric distillation system. 4,319,965, Cl. 202-205.000.
Parsson, Nils O., to Saab-Scania Aktiebolag. Arrangement in a ventilation system for a vehicle. 4,319,519, Cl. 98-2.110.
Partanen, Paul: *See*—
Suovaniemi, Osmo A.; Ekholm, Pertti; and Partanen, Paul, 4,319,841, Cl. 356-244.000.
Parthasarathy, R.; and Hort, Eugene V., to GAF Corporation. Catalytic oxidative dehydrogenation of alkenes or alkadienes to furan compounds. 4,320,031, Cl. 252-432.000.
Pataki, William V.; and Smay, O. Raymond, to Aluminum Company of America. Liquified gas cylinder anti-rotation device. 4,319,728, Cl. 248-154.000.
Patarra, Sam F. Cigarette with removable smoke-modifying cartridges. 4,319,590, Cl. 131-331.000.
Patel, Amrutlal D.: *See*—
Franke, Edward L., Jr.; Hartranft, George E.; and Patel, Amrutlal D., 4,319,473, Cl. 72-196.000.
Patel, Raman: *See*—
Coran, Aubert Y.; and Patel, Raman, 4,320,173, Cl. 428-457.000.
Paul Hettich & Co.: *See*—
Bachor, Jurgen, 4,319,794, Cl. 312-293.000.
Paul Revere Corporation, The: *See*—
Arnold, John; Groeneveld, Wilbur E.; and Heckley, Warner, 4,319,446, Cl. 56-341.000.
Pavliscak, Thomas J. Large area display. 4,320,418, Cl. 358-240.000.
Pcihoda, William W.: *See*—
Gursky, Michael T.; and Pcihoda, William W., 4,320,192, Cl. 430-323.000.
Pearce, Warren, Jr., to General Motors Corporation. Electrical connector with group terminal lock. 4,319,799, Cl. 339-217.00R.
Pechiney Ugine Kuhlmann: *See*—
Baudelet, Bernard; Suery, Michel; and Homer, Claude, 4,319,935, Cl. 148-32.000.
Peck, Gregory G. A.: *See*—
Dunham, Philip N.; Martin, Armand; and Peck, Gregory G. A., 4,319,524, Cl. 101-128.000.
Pehrson, John V., Sr.; and Pehrson, Marie S. Laser targets for roller alignment. 4,319,406, Cl. 33-295.000.
Pehrson, Marie S.: *See*—
Pehrson, John V., Sr.; and Pehrson, Marie S., 4,319,406, Cl. 33-295.000.
Pei, Yu K., to Owens-Illinois, Inc. Solar energy collector assembly. 4,319,561, Cl. 126-452.000.
Pellegata, Renato; and Gandolfi, Carmelo, to Farmitalia Carlo Erba S.p.A. Fluoro-prostaglandins and process for their preparation. 4,320,143, Cl. 424-305.000.
Pellegrin, Michael T.; Kreikebaum, Gerhard; and Shofner, Frederick M., to Owens-Corning Fiberglas Corporation. Electro-optic fiber monitor. 4,319,901, Cl. 65-2.000.
Pellet, Regis J.; and Bertolacini, Ralph J., to Standard Oil Company (Indiana). Reforming with an improved platinum-containing catalyst. 4,319,984, Cl. 208-138.000.
Pennella, Filippo, to Phillips Petroleum Company. Conversion of olefinic nitriles. 4,320,071, Cl. 260-464.000.
Perdue, Edward M., to United States of America, Air Force. High speed frequency acquisition apparatus for microwave synthesizers. 4,320,356, Cl. 331-11.000.
Perkin-Elmer Corporation, The: *See*—
Scott, Larkin B., 4,320,390, Cl. 340-347.0NT.
Pertle, John E.: *See*—
Saine, Thomas W.; and Pertle, John E., 4,319,503, Cl. 82-4.00C.
Pertzborn, James J.: *See*—
Heise, Nyles N.; Hoffman, Roy L.; Kiss, Istvan S.; Lewis, David O.; Pertzborn, James J.; and Robinson, Thomas S., 4,320,456, Cl. 364-200.000.
Pesando, Mario. Traverser and components therefor. 4,319,722, Cl. 244-116.000.
Peters, Judith A. Toddler-proof latch for toilet flush lever. 4,319,368, Cl. 4-661.000.
Petersen, Erwin: *See*—
Lindemann, Klaus; Rode, Konrad; and Petersen, Erwin, 4,320,459, Cl. 364-426.000.
Peterson, Phillip R.; Gavrielides, Athanasios; and Erkkila, John H., to United States of America, Air Force. Optical beam mode controlled laser system. 4,320,359, Cl. 372-18.000.
Peterson, Richard H. Electrically driven tremolo device. 4,319,513, Cl. 84-348.000.
Petocz, Lujza: *See*—
Benko, Pal; Messmer, Andras; Hajos, Gyorgy; Batori, Sandor; Petocz, Lujza; Kosoczky, Iboly; and Gorog, Peter, 4,320,127, Cl. 424-249.000.
Pett, Manfred, to Sartorius GmbH. Multiple filter case. 4,319,997, Cl. 210-85.000.
Petzolt, Gert: *See*—
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,319,736, Cl. 251-329.000.
Pfeifer, William, to Armstrong Store Fixture Corporation. Merchandise display assembly. 4,319,731, Cl. 248-223.400.
Pfizer Inc.: *See*—
Koe, Billie K., 4,320,124, Cl. 424-244.000.
Pham, Ngu T., to Thomson-CSF. Sequential logic element. 4,320,314, Cl. 307-288.000.
PHB-Weserhutte AG: *See*—
Kipper, Hans, 4,319,677, Cl. 198-585.000.
Philip A. Hunt Chemical Corp.: *See*—
Murski, Kenneth J., 4,319,955, Cl. 156-659.100.
Phillips, Lot: *See*—
Morris, Darryl C.; Saucier, Normand A.; and Phillips, Lot, 4,320,338, Cl. 324-60.00C.
Phillips, Martha E. Geodesic dome structure tie-beam connector. 4,319,853, Cl. 403-172.000.
Phillips Petroleum Company: *See*—
Hunt, Harold R., 4,320,090, Cl. 422-150.000.
Irvin, Howard B., 4,320,091, Cl. 422-190.000.
Makovec, Donald J.; and Hann, Paul D., 4,320,233, Cl. 568-697.000.
Pennella, Filippo, 4,320,071, Cl. 260-464.000.
Wishman, Marvin, 4,320,167, Cl. 428-288.000.
Photo Control Corporation: *See*—
Lindenfelser, Jerome W., 4,319,819, Cl. 354-154.000.
Pieper, Fritz: *See*—
Nagel, Hartmut; Zimmermann, Hans; Pieper, Fritz; and Plage, Dieter, 4,319,744, Cl. 271-222.000.
Piesch, Steffen; Engelhardt, Friedrich; Wille, Herbert; Weidemuller, Wolf; and Meyer, Artur, to Cassella Aktiengesellschaft. Process for the preparation of derivatives of 3-(4-hydroxy-anilino)carbazole. 4,320,060, Cl. 260-317.000.
Pike, Robert F., to PPG Industries, Inc. Method for bending and tempering an apertured glass sheet. 4,319,907, Cl. 65-106.000.
Pinard, Patrick, to Compagnie International pour l'Informatique Cii Honeywell Bull (Societe Anonyme). Arrangement for diverting documents in a machine incorporating means to sort the document. 4,319,745, Cl. 271-305.000.
Pinion, Dallas O.; and Sadler, William W., to American Brands, Inc. Method for high consistency refining of tobacco for film casting. 4,319,593, Cl. 131-372.000.
Pioneer Electronic Corporation: *See*—
Kikuchi, Takashi; and Ishii, Tsuneo, 4,320,493, Cl. 369-220.000.
Kikuchi, Takashi, 4,320,495, Cl. 369-226.000.
Kikuchi, Takashi, 4,320,496, Cl. 369-226.000.
Pisarevskij, Jurij V.: *See*—
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,319,808, Cl. 350-358.000.
Pitney Bowes Inc.: *See*—
Dannatt, Hugh S., 4,320,284, Cl. 219-469.000.
Dlugos, Daniel F., 4,320,461, Cl. 364-466.000.
Pittenger, Daniel I.: *See*—
Freers, Alan W.; and Pittenger, Daniel I., 4,320,349, Cl. 330-66.000.
Plage, Dieter: *See*—
Nagel, Hartmut; Zimmermann, Hans; Pieper, Fritz; and Plage, Dieter, 4,319,744, Cl. 271-222.000.
Plastics Engineering Company: *See*—
D'Alelio, Gaetano F.; and Waitkus, Phillip A., 4,320,217, Cl. 526-285.000.
Platmanufaktur AB: *See*—
Jakobsen, Kjell M., 4,320,083, Cl. 264-531.000.
Plog, Rudi: *See*—
Leiter, Heinz; and Plog, Rudi, 4,320,266, Cl. 200-4.000.
Plunkett, Allan B., to General Electric Company. Transistorized current controlled pulse width modulated inverter machine drive system. 4,320,331, Cl. 318-722.000.
Pogonowski, Ivo C., to Texaco Inc. Methods of forming swages for joining two small tubes. 4,319,393, Cl. 29-434.000.
Polaroid Corporation: *See*—
Carter, Stephen W.; Friedman, Harvey S.; and Lippert, Irving S., 4,319,827, Cl. 354-304.000.
Johnson, Bruce K., 4,319,817, Cl. 354-127.000.
Ostrowski, John C.; and Staller, Norman D., 4,319,820, Cl. 354-187.000.
Pollination Technics, Inc.: *See*—
Wiederrich, LeRoy J., 4,319,371, Cl. 6-1.000.
Pony International, Inc.: *See*—
Muller, Roberto; and Sousa, Antonio M., 4,319,412, Cl. 36-29.000.

Pope, Carl M., to Gulf Plastic Fabricated Products Company. Process for reinforcing a thermoplastic body. 4,319,944, Cl. 156-195.000.

Porta, Augusto; Kulhanek, Antonin; Groult, Alain; and Tourrier, Herve ' , to Battelle Memorial Institute. Method and machine for washing and bleaching textiles. 4,319,973, Cl. 204-133.000.

Porteous, David A.: *See—*
Smith, Eric G.; and Porteous, David A., 4,319,671, Cl. 188-196.00A.

Post Office, The: *See—*
Hensel, Paul C., 4,319,902, Cl. 65-4.210.

Powell, William S. Information communicating apparatus and method. 4,320,387, Cl. 340-825.340.

Power Curbers, Inc.: *See—*
Wise, James W., 4,319,859, Cl. 405-268.000.

PPG Industries, Inc.: *See—*
Cook, James A., Jr.; and Keim, William A., 4,320,070, Cl. 260-455.00A.
Gillery, F. Howard, 4,320,155, Cl. 427-160.000.
Grove, William S., deceased, 4,319,917, Cl. 71-105.000.
Gullett, Elmer G., 4,319,904, Cl. 65-27.000.
Nowakowski, Peter M.; Boberski, William G.; and Seiner, Jerome A., 4,319,926, Cl. 106-74.000.
Pike, Robert F., 4,319,907, Cl. 65-106.000.
Sensi, John E., 4,319,908, Cl. 65-182.500.

Praun, Ferdinand V.: *See—*
Hentschel, Bernhard; Ziebarth, Jurgen; Coenen, Alfred; Kosswig, Kurt; and Praun, Ferdinand V., 4,320,106, Cl. 423-424.000.

Preciform Inc.: *See—*
Menard, Jacques, 4,319,430, Cl. 49-404.000.

Preston, Harold, to Automated Components, Inc. Pocket creasing apparatus and method of creasing with same. 4,319,702, Cl. 223-38.000.

Preuss, Wolfgang: *See—*
Hill, Frank; Preuss, Wolfgang; Schindler, Joachim; Schmid, Rolf; and Struve, Alfred, 4,320,195, Cl. 435-55.000.

Prevent-A-Theft International Ltd.: *See—*
Dunham, Philip N.; Martin, Armand; and Peck, Gregory G. A., 4,319,524, Cl. 101-128.000.

Priarone, Paolo; and St. John, Peter A., to Baxter Travenol Laboratories, Inc. Photomultiplier protector for a fluorometer. 4,319,842, Cl. 356-317.000.

Price, Orville E. Leveling instrument. 4,319,405, Cl. 33-292.000.

Price, Ralph J.; and Albert, Jack. Remotely controlled oil drain valve. 4,319,664, Cl. 184-1.500.

Prince, Bruce A., to Prince Group, Inc., The. One step binding tape. 4,319,361, Cl. 2-274.000.

Prince Group, Inc., The: *See—*
Prince, Bruce A., 4,319,361, Cl. 2-274.000.

Procter & Gamble Company, The: *See—*
Lohman, Frederick H., 4,320,013, Cl. 252-8.800.
Riemersma, Coenraad E.; and Merz, Theodore P., 4,319,868, Cl. 425-290.000.

Prohaska, Hans: *See—*
Gille, Gunther; Goertler, Horst; and Prohaska, Hans, 4,320,329, Cl. 318-443.000.

Propster, Mark A.: *See—*
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, 4,319,903, Cl. 65-27.000.

Proudfoot Company, Inc., The: *See—*
Proudfoot, Don A., 4,319,661, Cl. 181-295.000.

Proudfoot, Don A., to Proudfoot Company, Inc., The. Acoustic space absorber unit. 4,319,661, Cl. 181-295.000.

Prozorov, Valery I.: *See—*
Bank, Mikhail U.; Prozorov, Valery I.; Rubichev, Nikolai A.; Odnolko, Mikhail V.; Rozenberg, Evgeny A.; Bessonov, Alexei F.; Berezjuk, Iraida K.; and Guzikov, Sergei D., 4,320,532, Cl. 455-226.000.

Pruf-und Forschungsinstitut fur die Schuhherstellung: *See—*
Mattil, Klaus, 4,319,413, Cl. 36-57.000.

Pryor, Jerry C.; and Jenson, Roger E., to Celotex Corporation, The. Heat recovery and melting system for scrap metals. 4,319,921, Cl. 75-65.00R.

Puech, Claude: *See—*
Leclerc, Pierre; Huignard, Jean-Pierre; Papuchon, Michel; and Puech, Claude, 4,320,475, Cl. 367-149.000.

Pullman Incorporated: *See—*
Gutridge, Jack E.; and Nagy, Ernest J., 4,319,528, Cl. 105-397.000.

Pure Air Corporation: *See—*
Marsh, R. Claude, 4,319,899, Cl. 55-416.000.

Puttner, Reinhold; Buhmann, Ulrich; and Joppien, Hartmut, to Schering Aktiengesellschaft. Thiazolylidene-oxo-propionitrile salts and insecticidal compositions containing these salts. 4,320,125, Cl. 424-248.510.

Quaker Oats Company, The: *See—*
Anderson, Hugh C.; Doyle, James E.; and Lembke, Russell B., 4,320,042, Cl. 523-144.000.
Anderson, Hugh C., 4,320,043, Cl. 523-144.000.

Queneau, Paul B.; Huggins, Dale K.; and Beckstead, Leo W., to Amax Inc. Autoclave soda digestion of refractory scheelite concentrates. 4,320,095, Cl. 423-61.000.

Queneau, Paul B.; Huggins, Dale K.; and Beckstead, Leo W., to Amax Inc. Combined autoclave soda digestion of wolframite and scheelite. 4,320,096, Cl. 423-61.000.

Quintin, Michel Y.: *See—*
Godard, Dominique N.; and Quintin, Michel Y., 4,320,517, Cl. 375-13.000.

Qureshi, Nawaz M., to Exide Corporation. Grid for batteries. 4,320,183, Cl. 429-211.000.

R/B Manufacturing, Inc.: *See—*
Brejcha, Robert J., 4,319,434, Cl. 51-177.000.

Rabinovitch, Elvira B.; and Summers, James W., to B. F. Goodrich Company, The. Transparent and translucent vinyl polymeric composite. 4,320,174, Cl. 428-518.000.

Radom, Czeslaw: *See—*
Jozwicki, Ryszard; Kluska, Bogdan; Radom, Czeslaw; and Pacholski, Jan, 4,319,448, Cl. 57-58.890.

Ragaller, Klaus: *See—*
Niemeyer, Lutz; and Ragaller, Klaus, 4,319,527, Cl. 102-314.000.

Raikov, Ivan Y.; Ivaschenko, Pavel A.; and Samoilovsky, Igor V. Liquid flow splitter. 4,319,608, Cl. 137-625.480.

Raimel, Gert: *See—*
Karlsson, Jan; and Raimel, Gert, 4,320,304, Cl. 290-55.000.

Randall, D'Arcy C.: *See—*
Kempf, Mark F.; Randall, D'Arcy C.; and Walworth, Timothy R., 4,320,452, Cl. 364-200.000.

Rappas, Alkis S.: *See—*
Menashi, Jameel; Rappas, Alkis S.; and Douglas, Donald A., 4,320,094, Cl. 423-56.000.

Rassias, John N.; and Clark, Cecily M. Building blocks, wall structures made therefrom and methods of making the same. 4,319,440, Cl. 52-438.000.

Rathbun, Donald J.; and O'Keefe, David B., to Honeywell Information Systems Inc. Digital frequency modulation and modified frequency modulation read recovery with data separation. 4,320,465, Cl. 364-900.000.

Rattay, Joan H. Expandable pot holder apparatus. 4,319,727, Cl. 248-149.000.

Rawicz, Harris C., to Lockheed Electronics Co., Inc. Target vehicle tracking apparatus. 4,320,287, Cl. 235-412.000.

Raytheon Company: *See—*
Glass, Jeremy M., 4,320,467, Cl. 364-900.000.

RCA Corporation: *See—*
Acampora, Alfonse, 4,320,503, Cl. 370-104.000.
Crandall, Richard S.; and Bloom, Allen, 4,320,489, Cl. 369-111.000.
Dischert, Robert A.; Nagle, Eugene M.; and Williams, James J., Jr., 4,320,416, Cl. 358-133.000.
Guarracini, Joseph; and Ruggeri, Vincent J., 4,320,487, Cl. 369-43.000.
Riddle, George H. N.; and Taylor, Byron K., 4,320,490, Cl. 369-126.000.
Rustman, James C., 4,320,491, Cl. 369-126.000.
White, Lawrence K.; and Wu, Chung P., 4,319,954, Cl. 156-628.000.
Witte, Walter R., 4,320,373, Cl. 336-183.000.

Read, Clifford D., to Northern Telecom Limited. Telephone handset with integral shoulder rest. 4,320,262, Cl. 179-103.000.

Reading & Bates Construction Co.: *See—*
Cherrington, Martin O., 4,319,648, Cl. 175-53.000.

Rebeller, Michel; Yout, Pierre; and Lonchamp, Daniel, to Institut Francais du Petrole. Process for selectively extracting dyestuffs contained in cyanophyceae algae, the so-extracted dyestuffs and their use, particularly in foodstuffs. 4,320,050, Cl. 260-112.00R.

Redman, Ronald E., to Kawneer Company, Inc. Weather stripping material. 4,320,161, Cl. 428-122.000.

Rehn, Larry A.: *See—*
Durham, Kenneth M., Jr.; Tarpley, Roy W.; and Rehn, Larry A., 4,319,483, Cl. 73-204.000.

Reierson, Robert L.; Bremmer, Bart J.; and Hanafin, Joseph W., to Dow Chemical Company, The. Hydraulic fluids containing cyano derivatives of cyclic ketals and acetals. 4,320,024, Cl. 252-78.300.

Reiff, Helmut: *See—*
Schwindt, Jurgen; Meyborg, Holger; Reiff, Helmut; and Konig, Klaus, 4,320,068, Cl. 260-453.0AB.

Reilly, Eugene P.: *See—*
Gobran, Riad H.; Takahashi, Akio; and Reilly, Eugene P., 4,320,036, Cl. 524-14.000.

Reischl, Artur; and Wagner, Kuno, to Bayer Aktiengesellschaft. Process for the production of polyurethane plastics in which polyisocyanates are reacted with reactive organic fillers comprising biomasses. 4,320,208, Cl. 521-102.000.

Reiss, Andre. Paper device for rapid detection of cocaine. 4,320,086, Cl. 422-56.000.

Reiss, Willi, to Licentia Patent-Verwaltungs-G.m.b.H. Microwave oven with resistance heating unit. 4,320,275, Cl. 219-10.55B.

Rello, Michael J.; and Detwiler, Barry R., to Exxon Research & Engineering Co. Method and means for storing typing ribbon. 4,319,850, Cl. 400-247.000.

Rengo Kabushiki Kaisha (Rengo Co., Ltd.): *See—*
Tokuno, Masateru, 4,319,947, Cl. 156-351.000.

Rensselaer Polytechnic Institute: *See—*
McDonald, John F.; Scarton, Henry A.; Kennedy, Warren C.; and Crilly, Paul B., 4,320,282, Cl. 219-137.0PS.

Rentzea, Costin: *See—*
Ammermann, Eberhard; Rentzea, Costin; and Jung, Johann, 4,319,911, Cl. 71-76.000.

Resnick, Bruce M., to GAF Corporation. Fungicidal use of diphenyl esters of alkylenes. 4,320,144, Cl. 424-311.000.

Respiratory Care, Inc.: *See—*
Cambio, Orlando D., 4,319,701, Cl. 222-541.000.

Reynolds, Lionel A. Vibrator devices in a roadroller. 4,319,857, Cl. 404-117.000.

Rezek, Edward A.: *See—*
Holonyak, Nick; and Rezek, Edward A., 4,319,937, Cl. 148-171.000.

Rhewum - Rheinische Werkzeug- u. Maschinenfabrik GmbH: *See—*
Krause, Rudolf, 4,319,993, Cl. 209-315.000.

Rich, Joseph A.; and Carroll, James J., to Electric Power Research Institute, Inc. Vacuum interrupter with increased separation of functions. 4,320,269, Cl. 200-144.00B.

Richard Heinze GmbH & Co. KG: *See—*
Zernig, Ernst, 4,319,382, Cl. 16-251.000.

Richard, Joseph G. Windmill. 4,319,865, Cl. 416-41.000.

Richman, Jay L., to Bendix Corporation, The. Monitored digital system. 4,320,512, Cl. 371-52.000.

Richter, Albert P., Jr.: *See—*
Langford, Obie M.; and Richter, Albert P., Jr., 4,320,446, Cl. 363-59.000.

Richter, Peter: *See—*
Heinz, Gerhard; Richter, Peter; and Jun, Mong-Jon, 4,320,188, Cl. 430-281.000.

Ricoh Company, Ltd.: *See—*
Sakamoto, Koji; Hayashi, Masayuki; Koizumi, Yutaka; and Tanzawa, Misao, 4,319,832, Cl. 355-15.000.

Riddle, George H. N.; and Taylor, Byron K., to RCA Corporation. Video disc cartridge having a self retaining electrode. 4,320,490, Cl. 369-126.000.

Rider, Ronald E., to Xerox Corporation. Hybrid bit clock servo. 4,320,420, Cl. 358-267.000.

Riemer, Dietrich E.: *See—*
Corwin, Rudolph E.; Riemer, Dietrich E.; and Stanbery, Billy J., 4,320,250, Cl. 136-256.000.

Riemersma, Coenraad E.; and Merz, Theodore P., to Procter & Gamble Company, The. Apparatus for embossing and perforating a running ribbon of thermoplastic film on a metallic pattern roll. 4,319,868, Cl. 425-290.000.

Rietsch, Eike, to Deutsche Texaco Aktiengesellschaft. Seismic surveying method. 4,320,471, Cl. 367-49.000.

Riggs, Dean D.; and McCarthy, David M., to Electron, Inc. Automated token system. 4,319,674, Cl. 194-4.00R.

Rinkleib, Helfried O., to International Business Machines Corporation. File protect sleeve. 4,320,422, Cl. 360-60.000.

Rinkleib, Helfried O.: *See—*
Larson, Richard T.; McMurtry, David H.; and Rinkleib, Helfried O., 4,320,421, Cl. 360-60.000.

Risse, Friedrich: *See—*
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,319,736, Cl. 251-329.000.

Roach, Terence. Multispectral light detection system. 4,319,830, Cl. 355-1.000.

Robbins, Richard W.: *See—*
Panaro, Robert J.; Robbins, Richard W.; and Smith, Charles F., 4,320,376, Cl. 337-252.000.

Robert Bosch GmbH: *See—*
Esper, Friedrich; and Wiedenmann, Hans-Martin, 4,320,080, Cl. 264-111.000.
Habich, Andreas; and Arnold, Josef, 4,320,181, Cl. 429-59.000.

Roberts, Peter T.: *See—*
Black, Malcolm H.; Frenkel, Alexander D.; and Roberts, Peter T., 4,320,142, Cl. 424-300.000.

Roberts, Thane H.: *See—*
Schweitzer, Henry H.; and Roberts, Thane H., 4,319,535, Cl. 114-91.000.
Schweitzer, Henry H.; and Roberts, Thane H., 4,319,536, Cl. 114-99.000.

Roberts, William H.; and Rutkowski, Paul A., to Digital House, Ltd. Dual sequencer microprocessor. 4,320,453, Cl. 364-200.000.

Robertshaw Controls Company: *See—*
Barker, Charles E.; Cairo, Anthony C.; Bauer, Frederick T.; and Jackson, Auzville, Jr., 4,319,711, Cl. 236-46.00R.
Everett, Charles J., 4,320,294, Cl. 250-231.00P.

Robichaud, Kenneth. Weighing device. 4,319,651, Cl. 177-229.000.

Robillard, Jean J., to Bristol-Myers Company. Photographic emulsions having special chromatic effects. 4,320,193, Cl. 430-503.000.

Robins, Seymour. Bulletin board. 4,319,422, Cl. 40-622.000.

Robinson, James D., to Imperial Chemical Industries Limited. Base for a bed. 4,319,370, Cl. 5-201.000.

Robinson, Thomas S.: *See—*
Heise, Nyles N.; Hoffman, Roy L.; Kiss, Istvan S.; Lewis, David O.; Pertzborn, James J.; and Robinson, Thomas S., 4,320,456, Cl. 364-200.000.

Roche, Hugo. Umbrella. 4,319,600, Cl. 135-20.00M.

Rockwell International Corporation: *See—*
Drapac, Michael J., 4,320,350, Cl. 330-202.000.

Rodaway, Keith S., to Everest & Jennings, Inc. Shock absorbing castor. 4,319,381, Cl. 16-44.000.

Rode, Konrad: *See—*
Lindemann, Klaus; Rode, Konrad; and Petersen, Erwin, 4,320,459, Cl. 364-426.000.

Roessler, Barton: *See—*
Narasimhan, Mandayam C.; Roessler, Barton; and Loferski, Joseph J., 4,320,251, Cl. 136-256.000.

Rogers, J. Frank. Convertible exercise bench and accessory apparatus. 4,319,747, Cl. 272-73.000.

Rogers, Walter C., Jr. Rocker-recliner chair. 4,319,780, Cl. 297-85.000.

Rohm, Gunter H. Fan-cooled actuator for power chuck. 4,319,516, Cl. 91-420.000.

Rohm and Haas Company: *See—*
Konen, John C., 4,320,206, Cl. 521-26.000.

Rolf Peddinghaus: *See—*
Wepner, Joachim; and Wengenroth, Kurt, 4,319,504, Cl. 83-157.000.

Rolm Corporation: *See—*
Graham, Martin H., 4,320,520, Cl. 375-36.000.

Roman Industries, Inc.: *See—*
Roucek, Dennis G., 4,320,382, Cl. 340-64.000.

Romano, Carmelo, to Azar, Joseph. Occupant propelled skateboard. 4,319,760, Cl. 280-11.115.

Rood, Allan J., to International Business Machines Corp. Two-direction rotary paper aligner. 4,319,743, Cl. 271-184.000.

Roos, Gerold, to Zellweger, Ltd. Apparatus for inserting a thread into a testing position of a tensile strength testing apparatus. 4,319,493, Cl. 73-828.000.

Rose, John B.; and Staniland, Philip A., to Imperial Chemical Industries Limited. Thermoplastic aromatic polyetherketones. 4,320,224, Cl. 528-125.000.

Rose, Steven A.; and Forrester, Edward H., to Honeywell Inc. Protection apparatus for multiple processor systems. 4,320,450, Cl. 364-200.000.

Rosen, Louis M. Support member. 4,319,704, Cl. 224-270.000.

Rosenbaum, Glen F., to CMI Corporation. Reversible push block-rear bumper and pintle hook assemblies. 4,319,765, Cl. 280-504.000.

Rossmann, Dieter, to Carl Zeiss-Stiftung. Rebound damping means for fast-closing photographic diaphragms. 4,319,824, Cl. 354-272.000.

Rothfuss, Robert G., to Senco Products, Inc. Intralumenal anastomosis surgical stapling instrument. 4,319,576, Cl. 128-305.000.

Rothwell, Harold L., Jr.; Keeffe, William M.; and Gungle, W. Calvin, to GTE Products Corporation. Electrode geometry to improve arc stability. 4,320,322, Cl. 313-217.000.

Roucek, Dennis G., to Roman Industries, Inc. Automotive alarm. 4,320,382, Cl. 340-64.000.

Roy, Denis R. J.: *See—*
Teller, Aaron J.; and Roy, Denis R. J., 4,319,890, Cl. 55-1.000.

Roy, Paul A., to Aldila, Inc. Golf shaft having controlled flex zone. 4,319,750, Cl. 273-80.00B.

Royston Manufacturing Corporation: *See—*
Suttles, J. Marshall, 4,319,793, Cl. 312-257.00R.

Rozenberg, Evgeny A.: *See—*
Bank, Mikhail U.; Prozorov, Valery I.; Rubichev, Nikolai A.; Odnolko, Mikhail V.; Rozenberg, Evgeny A.; Bessonov, Alexei F.; Berezjuk, Iraida K.; and Guzikov, Sergei D., 4,320,532, Cl. 455-226.000.

RTE Corporation: *See—*
Dehn, Rudolph A., 4,320,274, Cl. 219-10.55E.
Lien, Wayne W., 4,320,375, Cl. 337-204.000.

Rubichev, Nikolai A.: *See—*
Bank, Mikhail U.; Prozorov, Valery I.; Rubichev, Nikolai A.; Odnolko, Mikhail V.; Rozenberg, Evgeny A.; Bessonov, Alexei F.; Berezjuk, Iraida K.; and Guzikov, Sergei D., 4,320,532, Cl. 455-226.000.

Rubin, Michael D.; and Ho, Pang T., to Ford Aerospace & Communications Corp. Input optimized FET bias circuit. 4,320,352, Cl. 330-277.000.

Rubinshtein, Bernard. Rotary internal combustion engine. 4,319,551, Cl. 123-245.000.

Rudolph, Kenneth E., Jr., to Vibranetics, Inc. Apparatus for full voltage start of vibratory excitors. 4,320,328, Cl. 318-431.000.

Ruedin, Yves, to Ebauches S.A. Method of manufacturing the substrate of an electrochromic display cell. 4,320,190, Cl. 430-296.000.

Ruggeri, Vincent J.: *See—*
Guarracini, Joseph; and Ruggeri, Vincent J., 4,320,487, Cl. 369-43.000.

Ruhr-Stickstoff Aktiengesellschaft: *See—*
Baltruschat, Helmut; Bellut, Hans; and Schnurbusch, Horst, 4,319,918, Cl. 71-118.000.

Rung, Jr.: *See—*
Walker, Laurence G.; Sansbury, James D.; Rung, Jr.; and Manoliu, Juliana, 4,320,312, Cl. 307-238.800.

Rush, William F.: *See—*
Anderson, Gerald L.; Onischak, Michael; and Rush, William F., 4,319,891, Cl. 55-15.000.

Russell, George F. Uniform surface temperature heat pipe and method of using the same. 4,320,246, Cl. 136-248.000.

Russell, James T., to Digital Recording Corporation. Recording and playback system. 4,320,488, Cl. 369-44.000.

Russell, Robert J., to Mail-Ex Corporation. Envelope processing machine with incremental feed mechanism. 4,319,444, Cl. 53-569.000.

Rustman, James C., to RCA Corporation. Apparatus for video disc stylus electrode reconditioning. 4,320,491, Cl. 369-126.000.

Ruth, George L.: *See—*
Krogseng, Gerald P.; Mandell, Joseph G.; and Ruth, George L., 4,319,623, Cl. 160-90.000.

Rutkowski, Paul A.: *See—*
Roberts, William H.; and Rutkowski, Paul A., 4,320,453, Cl. 364-200.000.

Ryan, Douglas R., to Exxon Research & Engineering Co. Continuous autorefrigerative dewaxing apparatus. 4,319,962, Cl. 196-14.500.

S. Himmelstein and Company: *See—*
Himmelstein, Sydney, 4,320,463, Cl. 364-552.000.

Saab-Scania Aktiebolag: *See—*
Parsson, Nils O., 4,319,519, Cl. 98-2.110.
Saba, Manlio: *See—*
Biggiogera, Giancarlo; and Saba, Manlio, 4,320,265, Cl. 179-170.00R.
Sadex, Kadry: *See—*
Hausler, Michael; and Sadex, Kadry, 4,320,444, Cl. 363-35.000.
Sadler, William W.: *See—*
Pinion, Dallas O.; and Sadler, William W., 4,319,593, Cl. 131-372.000.
Sado, Ichiro, to Canon Kabushiki Kaisha. Numerical value input display. 4,320,396, Cl. 340-799.000.
Sadoulet, Jean-Paul: *See—*
Thuries, Edmond; Sadoulet, Jean-Paul; and Sanchez, Alain, 4,320,372, Cl. 336-92.000.
Saeki, Noriaki: *See—*
Ito, Akihiko; and Saeki, Noriaki, 4,319,465, Cl. 64-21.000.
Safe-T Pacific Co.: *See—*
Stevens, Noel W., 4,319,696, Cl. 221-310.000.
Saga, Ryokichi: *See—*
Koga, Keiichiro; Yasuda, Yutaka; Saga, Ryokichi; and Takimoto, Yukio, 4,320,511, Cl. 371-37.000.
Sagisaka, Yasuo: *See—*
Tajima, Masahiko; Sagisaka, Yasuo; Kondo, Toshio; and Kobayashi, Akio, 4,319,451, Cl. 60-274.000.
Saine, Thomas W.; and Pertle, John E., to Tri Tool Inc. Tube facing machine. 4,319,503, Cl. 82-4.00C.
Saint Gobain Industries: *See—*
Auger, Robert H., 4,319,844, Cl. 356-399.000.
St. John, Peter A.: *See—*
Prisarone, Paolo; and St. John, Peter A., 4,319,842, Cl. 356-317.000.
Sakai, Koichi; and Horie, Satoru, to Toko Kabushiki Kaisha. Loudness control circuit. 4,320,534, Cl. 455-267.000.
Sakai, Takami: *See—*
Kobayashi, Sumio; Takahashi, Tadashi; Ino, Hidetoshi; and Sakai, Takami, 4,320,445, Cl. 363-54.000.
Sakai, Tokuji: *See—*
Onodera, Tamio; Sakai, Tokuji; Yamasaki, Yasuo; Sumitani, Koji; and Sueoka, Minekazu, 4,320,242, Cl. 585-489.000.
Sakamaki, Hisashi: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,319,828, Cl. 355-3.00R.
Sakamaki, Jun: *See—*
Imai, Kazuhiro; Yamada, Shigemitsu; Kubota, Hidehiro; and Sakamaki, Jun, 4,319,883, Cl. 23-230.00B.
Sakamoto, Koji; Hayashi, Masayuki; Koizumi, Yutaka; and Tanzawa, Misao, to Ricoh Company, Ltd. Toner separation and recovery apparatus. 4,319,832, Cl. 355-15.000.
Sakamoto, Seiji: *See—*
Watanabe, Masamichi; and Sakamoto, Seiji, 4,320,207, Cl. 521-54.000.
Sakamoto, Yukio; Arakawa, Yoshio; and Takahashi, Seiichi, to Murata Manufacturing Co., Ltd. Capacitor arrangement. 4,320,364, Cl. 333-167.000.
Sala, Gianfranco: *See—*
Lambertini, Giorgio; and Sala, Gianfranco, 4,319,848, Cl. 366-136.000.
Salga Associates Limited & Company: *See—*
Elgner, Claude F., 4,320,084, Cl. 264-540.000.
Salicini, Sandro, to Carle & Montanari S.p.A. Coupling and uncoupling apparatus. 4,319,495, Cl. 74-405.000.
Samoilovsky, Igor V.: *See—*
Raikov, Ivan Y.; Ivaschenko, Pavel A.; and Samoilovsky, Igor V., 4,319,608, Cl. 137-625.480.
Samsonova, Evgeny G., administrator: *See—*
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonova, Grigory V., deceased; Samsonova, Nadezhda A., administrator; Samsonova, Natalya G., administrator; and Samsonova, Evgeny G., administrator, 4,319,715, Cl. 239-81.000.
Samsonova, Grigory V., deceased: *See—*
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonova, Grigory V., deceased; Samsonova, Nadezhda A., administrator; Samsonova, Natalya G., administrator; and Samsonova, Evgeny G., administrator, 4,319,715, Cl. 239-81.000.
Samsonova, Nadezhda A., administrator: *See—*
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonova, Grigory V., deceased; Samsonova, Nadezhda A., administrator; Samsonova, Natalya G., administrator; and Samsonova, Evgeny G., administrator, 4,319,715, Cl. 239-81.000.
Samsonova, Natalya G., administrator: *See—*
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonova, Grigory V., deceased; Samsonova, Nadezhda A., administrator; Samsonova, Natalya G., administrator; and Samsonova, Evgeny G., administrator, 4,319,715, Cl. 239-81.000.
San Angelo Electric Service Company: *See—*
Duenke, Clarence G., 4,320,432, Cl. 361-39.000.
Sanchez, Alain: *See—*
Thuries, Edmond; Sadoulet, Jean-Paul; and Sanchez, Alain, 4,320,372, Cl. 336-92.000.
Sanderson, Charles H.; and Sanderson, Charles W., to Kemtune, Inc. Bypass water conditioner. 4,320,003, Cl. 210-222.000.
Sanderson, Charles W.: *See—*
Sanderson, Charles H.; and Sanderson, Charles W., 4,320,003, Cl. 210-222.000.
Sandoz, Inc.: *See—*
Kathawala, Faizulla G., 4,320,135, Cl. 424-273.00R.
Sandoz Ltd.: *See—*
Hamberger, Helmut; Stutz, Peter; Scholz, Dieter; and Fliri, Hans, 4,320,133, Cl. 424-269.000.
Sandrock, Gerhard: *See—*
Volkamer, Klaus; Lindner, Alfred; Merger, Franz; Wagner, Ulrich; Brunner, Erwin; Sandrock, Gerhard; and Strohmeyer, Max, 4,320,232, Cl. 568-697.000.
Sandvik Aktiebolag: *See—*
Brandt, Gunnar; Bjorkman, Carl P.; and Ekemar, Carl S. G., 4,320,203, Cl. 501-87.000.
Sanezawa, Fumio: *See—*
Yoneda, Kenji; Sanezawa, Fumio; Takagi, Yasuo; and Ushijima, Yuji, 4,319,549, Cl. 123-198.00E.
Sangamo Weston, Inc.: *See—*
Waggener, William N., 4,320,345, Cl. 329-50.000.
Sansbury, James D.: *See—*
Walker, Laurence G.; Sansbury, James D.; Rung, Jr.; and Manoliu, Juliana, 4,320,312, Cl. 307-238.800.
Sanui, Yoshio; Wakahara, Kaoru; and Yasui, Yasuyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Lubricating device for final drive gearing of power transmission unit. 4,319,499, Cl. 74-700.000.
Sanyo Electric Co., Ltd.: *See—*
Ikeda, Saburo, 4,320,530, Cl. 455-182.000.
Saraf, Dilip G.: *See—*
Brown, Floyd A., Jr.; and Saraf, Dilip G., 4,320,351, Cl. 330-260.000.
Sarantakis, Dimitrios, to American Home Products Corporation. Analgesic tripeptide amides. 4,320,051, Cl. 260-112.50E.
Sartorius GmbH: *See—*
Pett, Manfred, 4,319,997, Cl. 210-85.000.
Sasaki, Yutaka, to Nippon Electric Co., Ltd. Solid-state amplifier circuit for high-frequency signals. 4,320,353, Cl. 330-286.000.
Sato, Hiroshi; Shigeta, Sadaaki; and Takenaka, Yasuo, to Mitsubishi Rayon Company, Limited. Oil-containing waste water treating material consisting of modified active carbon. 4,320,011, Cl. 210-694.000.
Sato, Masahiro; and Tanaka, Norio, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle wheel. 4,319,785, Cl. 301-6.0CS.
Satoh, Kazuo: *See—*
Suzuki, Shinjiro; Yoshikawa, Tadashi; Otsuki, Tsuguo; Takeda, Masao; Kamoi, Nobuhisa; and Satoh, Kazuo, 4,320,348, Cl. 330-52.000.
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Morris, Darryl C.; Saucier, Normand A.; and Phillips, Lot, 4,320,338, Cl. 324-60.00C.
Sauer, Alfred B.: *See—*
Corteg, Walter V.; Gillies, Jack K.; and Sauer, Alfred B., 4,319,766, Cl. 280-511.000.
Sauer, Fred N.; and Barry, J. Brian. Pre-combustion system for internal combustion engines. 4,319,552, Cl. 123-297.000.
Saunders, Robert L., to Abex Corporation. Passenger loading bridge. 4,319,376, Cl. 14-71.500.
Sawada, Yoshio: *See—*
Aoki, Harumi; and Sawada, Yoshio, 4,319,813, Cl. 354-25.000.
Sawafuji Electric Co., Ltd.: *See—*
Okuda, Yukio; Katayama, Naohiro; and Izumi, Tosio, 4,320,448, Cl. 363-134.000.
Sawano, Takashi, to Xerox Corporation. Fuser apparatus and control therefore. 4,319,874, Cl. 432-60.000.
Sawara, Kenji, to Fuji Koeki Corporation. Photographic camera. 4,319,818, Cl. 354-145.000.
Scantland, Joseph F.; and Flory, Thomas A. Loader drive compensator and safety device. 4,319,869, Cl. 425-38.000.
Scarberry, Robert M.: *See—*
Zoleski, Benjamin H.; Hebert, Gayle P.; Sung, Rodney L.; and Scarberry, Robert M., 4,320,016, Cl. 252-42.700.
Scarton, Henry A.: *See—*
McDonald, John F.; Scarton, Henry A.; Kennedy, Warren C.; and Crilly, Paul B., 4,320,282, Cl. 219-137.0PS.
Scerbo, Louis J.; and Starace, Jeremia P., to Bell Telephone Laboratories, Incorporated. Cable routing methods and apparatus. 4,320,261, Cl. 179-98.000.
Schaeufele, Peter J., to Lonza Inc. Disinfectant composition and the use thereof. 4,320,147, Cl. 424-329.000.
Schambeck, Herbert, to Dyckerhoff & Widmann Aktiengesellschaft. Method of constructing a stayed girder bridge. 4,319,374, Cl. 14-1.000.
Scharton, Terry D.; and Taylor, G. Bruce, to Anco Engineers, Inc. Ultrasonic cleaner. 4,320,528, Cl. 376-310.000.
Schatton, Helmut; and Krickau, Walter, to Huttenwerke Kayser Aktiengesellschaft. Method and apparatus for electrolytic separation of metals, particularly copper. 4,319,970, Cl. 204-106.000.
Schaub, Andres: *See—*
Koci, Zdenek; and Schaub, Andres, 4,319,881, Cl. 8-532.000.

Schecter, Rubin. Anti-rust water treatment apparatus. 4,320,004, Cl. 210-266.000.
Scheithauer, William, Jr.: *See*—
Oakes, James J.; and Scheithauer, William, Jr., 4,320,156, Cl. 427-213.000.
Schenck, Hans-Uwe: *See*—
Denzigger, Walter; Herrle, Karl; and Schenck, Hans-Uwe, 4,320,114, Cl. 424-80.000.
Schering Aktiengesellschaft: *See*—
Puttner, Reinhold; Buhmann, Ulrich; and Joppien, Hartmut, 4,320,125, Cl. 424-248.510.
Scheuchzer, Fredy; and Buhler, Fritz, to Les Fils d'Auguste Scheuchzer, S.A. Method for draining a railway track and a railway train for use in said method. 4,319,416, Cl. 37-104.000.
Schiavone, Frank J., to Ball Corporation. Broadband microstrip antenna with automatically progressively shortened resonant dimensions with respect to increasing frequency of operation. 4,320,401, Cl. 343-700.0MS.
Schickfluss, Rudolf: *See*—
Opitz, Konrad; and Schickfluss, Rudolf, 4,319,880, Cl. 8-526.000.
Schierjott, Rudolf, to Siemens Aktiengesellschaft. Arrangement for interference suppression of electromagnetic circuits. 4,320,307, Cl. 307-91.000.
Schimmel, Norbert, to New Hermes Incorporated. Nameplate device and kit for making same. 4,319,417, Cl. 40-10.00R.
Schindler, Joachim: *See*—
Hill, Frank; Preuss, Wolfgang; Schindler, Joachim; Schmid, Rolf; and Struve, Alfred, 4,320,195, Cl. 435-55.000.
Schjeldahl, Gilmore T. Reciprocally moving hot-wire for bag making machine. 4,319,952, Cl. 156-510.000.
Schlarlack, Ronald S., to Thermo Electron Corporation. Solar tracking system. 4,320,288, Cl. 250-203.00R.
Schlecht, Annegret: *See*—
Simm, Hans-Peter; Guhne, Wieland; and Schlecht, Annegret, 4,319,380, Cl. 15-410.000.
Schlumberger Technology Corp.: *See*—
DerMott, Raymond W., 4,319,526, Cl. 102-310.000.
Frawley, William J.; and Mongelluzzo, Philip A., 4,320,469, Cl. 367-33.000.
Vincent, Philippe, 4,320,458, Cl. 364-422.000.
Schmid, Rolf: *See*—
Hill, Frank; Preuss, Wolfgang; Schindler, Joachim; Schmid, Rolf; and Struve, Alfred, 4,320,195, Cl. 435-55.000.
Schmitt, Frederick L.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Granda, Edward J.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,319,586, Cl. 131-276.000.
Schneider, Wolfgang, to B. F. Goodrich Company, The. Reaction products of an olefin, a norbornene and a cyclopentadiene. 4,320,239, Cl. 585-360.000.
Schnurbusch, Horst: *See*—
Baltruschat, Helmut; Bellut, Hans; and Schnurbusch, Horst, 4,319,918, Cl. 71-118.000.
Schoeneman, David D.: *See*—
Heilhecker, Joe K.; and Schoeneman, David D., 4,319,410, Cl. 34-75.000.
Scholz, Dieter: *See*—
Hamberger, Helmut; Stutz, Peter; Scholz, Dieter; and Fliri, Hans, 4,320,133, Cl. 424-269.000.
Scholz, Manfred; and Kaiser, Karl, to Hoechst Aktiengesellschaft. Apparatus for drying chlorinated polymers. 4,319,409, Cl. 34-58.000.
Schomer, Marion L.: *See*—
Hewson, John E.; and Schomer, Marion L., 4,319,492, Cl. 73-756.000.
Schonhardt, Peter, to Dieter Graesslin Feinwerktechnik. Switch chain with switch riders for switch clocks. 4,320,480, Cl. 368-78.000.
Schubert, Malvin L., to General Motors Corporation. Hydraulic power brake system and hydraulic brake booster and controls therefor. 4,319,455, Cl. 60-547.00R.
Schubert & Salzer: *See*—
Hofmann, Eberhard, 4,319,449, Cl. 57-58.890.
Schukin, Lev I.: *See*—
Alexandrov, Vitaly V.; Bezlepkin, Anatoly I.; Konstantinov, Boris A.; Melnikova, Olga V.; Khomyak, Anatoly S.; Schukin, Lev I.; and Chukin, Marat S., 4,320,321, Cl. 313-209.000.
Schultz, Edwin R., to United States of America, Air Force. Stabilizer for an ejection seat. 4,319,723, Cl. 244-122.00A.
Schulz, Galyn A., to American Can Company. Multi-ply fibrous sheet structure and its manufacture. 4,320,162, Cl. 428-154.000.
Schulz, Johann G.; Barie, Walter P., Jr.; and Eurich, James T., to Gulf Research & Development Corp. Molded epoxy resin product containing acids from oxidation of carbonaceous materials and process for producing same. 4,320,223, Cl. 527-501.000.
Schulze-Berge, Klaus: *See*—
Knerich, Werner; Boehm, Udo; Schulze-Berge, Klaus; and Brotzler, Roland, 4,320,429, Cl. 360-130.340.
Schwartz, Harold O.; Kidd, Dennis E.; and Hoskinson, William R., to Wurlitzer Company, The. Modular, expandable digital organ system. 4,319,508, Cl. 84-1.010.
Schwartz, Larry A.; Geiter, Robert; and Albertsen, Peter S., to Jamestown Group. Catalytic stove. 4,319,556, Cl. 126-77.000.
Schwartz, William C., to Burlington Industries, Inc. Three-dimensional ceiling board facing. 4,320,163, Cl. 428-158.000.
Schweitzer, Henry H.; and Roberts, Thane H., to Schweitzer, Henry Hoyle. Spar base. 4,319,535, Cl. 114-91.000.
Schweitzer, Henry H.; and Roberts, Thane H., to Schweitzer, Henry Hoyle. Boom attaching mechanism. 4,319,536, Cl. 114-99.000.
Schweitzer, Henry Hoyle: *See*—
Schweitzer, Henry H.; and Roberts, Thane H., 4,319,535, Cl. 114-91.000.
Schweitzer, Henry H.; and Roberts, Thane H., 4,319,536, Cl. 114-99.000.
Schwindt, Jurgen; Meyborg, Holger; Reiff, Helmut; and Konig, Klaus, to Bayer Aktiengesellschaft. Process for the production of polyisocyanates having a biuret structure. 4,320,068, Cl. 260-453.0AB.
Scott, Larkin B., to Perkin-Elmer Corporation, The. High resolution analog to digital converter. 4,320,390, Cl. 340-347.0NT.
Scribner, Richard M., to Du Pont de Nemours, E. I., and Company. 8-Aza-16,16-difluoroprostanoids. 4,320,136, Cl. 424-274.000.
Sears, Barry D. Method of emulsifying cholesterol, cholesterol esters and triglyceride compounds. 4,320,121, Cl. 424-199.000.
Seeley, William J., to Monarch Marking Systems, Inc. Composite label web roll. 4,320,158, Cl. 428-42.000.
Segal, Robert M., to Flintkote Company, The. Portland-type cements. 4,319,927, Cl. 106-89.000.
Seiler, Sebastian: *See*—
Mayerbock, Gottfried; Strobl, Rupert; and Seiler, Sebastian, 4,319,415, Cl. 37-67.000.
Seiner, Jerome A.: *See*—
Nowakowski, Peter M.; Boberski, William G.; and Seiner, Jerome A., 4,319,926, Cl. 106-74.000.
Seitz, Robert F., to Youngstown Steel Door Company, The. Auxiliary crank end. 4,319,429, Cl. 49-220.000.
Seki, Naoki: *See*—
Yamaguchi, Keiki; Takeuchi, Yasuhito; Shimazaki, Toru; and Seki, Naoki, 4,319,489, Cl. 73-626.000.
Sekiguchi, Mitsuo, to Alps Electric Co., Ltd. Filter for microwaves. 4,320,368, Cl. 333-209.000.
Sekine, Mitsuo; and Nishikubo, Yasuhiko, to Citizen Watch Co., Ltd. Analogue electronic timepiece with an alarm device. 4,320,479, Cl. 368-74.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Harayama, Hiroshi; Shinkai, Ken; Takahashi, Hiroshi; and Mizusako, Masahiro, 4,320,214, Cl. 525-264.000.
Sellen, Kenneth R.: *See*—
Goldis, Alexander; Sellen, Kenneth R.; and Banka, Eugene F., 4,320,407, Cl. 346-140.00R.
Semiconductor Research Foundation: *See*—
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,320,410, Cl. 357-43.000.
Senco Products, Inc.: *See*—
Rothfuss, Robert G., 4,319,576, Cl. 128-305.000.
Seng, Stephen: *See*—
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, 4,319,903, Cl. 65-27.000.
Sensi, John E., to PPG Industries, Inc. Float glass forming chamber with a flat slab roof. 4,319,908, Cl. 65-182.500.
Sensor Developments, Inc.: *See*—
Brendel, Albert E., 4,319,650, Cl. 177-156.000.
Sensyu, Akira: *See*—
Kondo, Jyunichi; Sensyu, Akira; Ono, Hidetaka; and Honda, Hiroki, 4,320,092, Cl. 422-224.000.
Seragnoli, Enzo, to G.D Societa per Azioni. Magazine-type cigarette feeding apparatuses for a cigarette packaging machine. 4,319,861, Cl. 414-419.000.
Service d'Exploitation Industrialle des Tabacs et des Allumettes: *See*—
Leclerc, Jean-Francois; Paret, Jacques; and Waegaert, Pierre, 4,319,592, Cl. 131-365.000.
Shaffer, John W.: *See*—
Brower, Boyd G.; and Shaffer, John W., 4,320,440, Cl. 362-13.000.
Shank, Herbert C., to Anchor Hocking Corporation. Container masking and coating apparatus. 4,319,543, Cl. 118-503.000.
Sharma, Yash. Method for detecting immunological agglutination and biochemical agent therefor. 4,319,882, Cl. 23-230.00B.
Sharp Kabushiki Kaisha: *See*—
Maeda, Hidetoshi; Inoue, Kazuo; and Someno, Noboru, 4,320,529, Cl. 455-158.000.
Shaw, Allan, to University of Adelaide, a part interest. Method of air conditioning. 4,319,461, Cl. 62-93.000.
Shaw, David G.; and Yializis, Angelo, to General Electric Company. Capacitor with edge coated electrode. 4,320,437, Cl. 361-303.000.
Shaw, Donald L.; McGlothlin, Quentin T.; O'Brien, Barry M.; Keck, John W.; and Freyberger, Wilfred L., to Exxon Research & Engineering Co. Branched alkyl ether amines as iron ore flotation aids. 4,319,987, Cl. 209-166.000.
Shaw, J. Howard, to McGraw-Edison Company. Arc gas control device for a power class fuse having load break contacts. 4,320,377, Cl. 337-278.000.
Shell Oil Company: *See*—
Chatterjee, Ananda M., 4,320,209, Cl. 525-6.000.
Lopez, John A., 4,320,222, Cl. 528-89.000.
Shen, Mitchel M.: *See*—
Osada, Yoshihito; Bell, Alexis T.; and Shen, Mitchel M., 4,320,219, Cl. 528-4.0AD.
Shigeta, Sadaaki: *See*—
Sato, Hiroshi; Shigeta, Sadaaki; and Takenaka, Yasuo, 4,320,011, Cl. 210-694.000.
Shikler, Arie: *See*—
Leonard, Larry W.; and Shikler, Arie, 4,319,778, Cl. 296-166.000.

Shimada, Satoshi: *See*—
Tanabe, Masanori; Shimada, Satoshi; Yasukawa, Akio; Nemoto, Hideyuki; Nishihara, Motohisa; Tsuchiya, Masatoshi; and Soeno, Ko, 4,319,397, Cl. 29-589.000.
Shimano Industrial Company Limited: *See*—
Hotta, Masashi, 4,319,629, Cl. 165-47.000.
Kojima, Masao, 4,319,673, Cl. 192-4.00R.
Shimazaki, Toru: *See*—
Yamaguchi, Keiki; Takeuchi, Yasuhito; Shimazaki, Toru; and Seki, Naoki, 4,319,489, Cl. 73-626.000.
Shimoda, Hiroshi: *See*—
Takei, Yasuharu; Kodama, Yasuharu; Shimoda, Hiroshi; and Ohi, Satoshi, 4,320,139, Cl. 424-282.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Takamizawa, Minoru; Shinohara, Toshio; Yamamoto, Yasushi; Tanino, Tasuku; Takano, Kiyoyuki; and Mori, Fumiaki, 4,320,172, Cl. 428-447.000.
Shine, Thomas M. Gravity operated track. 4,319,425, Cl. 46-43.000.
Shinji, Masaaki: *See*—
Horikawa, Izumi; and Shinji, Masaaki, 4,320,523, Cl. 375-103.000.
Shinkai, Ken: *See*—
Harayama, Hiroshi; Shinkai, Ken; Takahashi, Hiroshi; and Mizusako, Masahiro, 4,320,214, Cl. 525-264.000.
Shinohara, Toshio: *See*—
Takamizawa, Minoru; Shinohara, Toshio; Yamamoto, Yasushi; Tanino, Tasuku; Takano, Kiyoyuki; and Mori, Fumiaki, 4,320,172, Cl. 428-447.000.
Shinto, Hiroaki; and Yamada, Shigemichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for turning over a clutch pedal. 4,319,497, Cl. 74-512.000.
Shionogi & Co., Ltd.: *See*—
Morihara, Kazuyuki; Oka, Tatsushi; and Tsuzuki, Hiroshige, 4,320,196, Cl. 435-70.000.
Morihara, Kazuyuki; Oka, Tatsushi; Soejima, Masami; and Masaki, Takeharu, 4,320,197, Cl. 435-70.000.
Shiraishi, Hideo: *See*—
Taniguchi, Harutaka; Hara, Kenichi; Shiraishi, Hideo; and Kiyofuji, Shinji, 4,320,378, Cl. 338-34.000.
Shoei Electric Co., Ltd.: *See*—
Kohga, Masayuki; and Taguchi, Shigemitsu, 4,320,306, Cl. 307-51.000.
Shoemaker, Roger D. Buckle with rigid plate and sleeve. 4,319,386, Cl. 24-164.000.
Shoesmith, Rollo, Jr. Bridge and die attachment for cutting torches. 4,319,933, Cl. 148-9.00R.
Shofner, Frederick M.: *See*—
Pellegrin, Michael T.; Kreikebaum, Gerhard; and Shofner, Frederick M., 4,319,901, Cl. 65-2.000.
Shoji, Masakazu, to Bell Telephone Laboratories, Incorporated. Complementary field-effect transistor integrated circuit device. 4,320,409, Cl. 357-42.000.
Shuey, John R.: *See*—
Hanna, Nabil S.; and Shuey, John R., 4,319,733, Cl. 248-507.000.
Shuji, Takeshita, to Fujitsu Limited. Method for achieving alignment between objects. 4,319,845, Cl. 356-400.000.
Siare-Societe Industrielle d'Applications/Radio-Electriques: *See*—
Visan, Michel; and Isfan, Lydia, 4,320,264, Cl. 179-115.50R.
Siemens Aktiengesellschaft: *See*—
Grabmaier, Josef, 4,319,953, Cl. 156-608.000.
Heinzl, Joachim, 4,320,406, Cl. 346-140.00R.
Immler, Josef, 4,320,336, Cl. 323-324.000.
Kammerlander, Karl, 4,320,516, Cl. 375-10.000.
Kaschte, Walter, 4,320,363, Cl. 333-165.000.
Lampert, Ernst, 4,320,513, Cl. 375-1.000.
Lechner, Robert, 4,320,260, Cl. 179-18.0FA.
Schierjott, Rudolf, 4,320,307, Cl. 307-91.000.
Stein, Karl U., 4,320,302, Cl. 250-578.000.
Volejnik, Wilhelm; Kuenemund, Friedrich; Traub, Karl; and Albsmeier, Hans, 4,320,366, Cl. 333-197.000.
Sierracin Corporation: *See*—
Borrup, Ronald J., 4,320,286, Cl. 219-549.000.
Siers, Gerald D. Adjustable boxcar devices. 4,319,431, Cl. 49-426.000.
Sietmann, Vernon H.; Stockdale, Steven C.; and Stockdale, Elmer G. Heat exchanger furnace. 4,319,557, Cl. 126-110.00R.
Silvestrova, Iraida M.: *See*—
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,319,808, Cl. 350-358.000.
Simm, Hans-Peter; Guhne, Wieland; and Schlecht, Annegret, to Vorwerk & Co. Interholding GmbH. Telescopable guiding device for household apparatus. 4,319,380, Cl. 15-410.000.
Singer Company, The: *See*—
Mallett, John H., 4,320,391, Cl. 340-347.0SY.
Singerman, Gary M., to United States of America, Energy. Process for preparing a liquid fuel composition. 4,319,981, Cl. 208-8.00R.
Sinon, Gregory K.: *See*—
Buck, Daniel C.; and Sinon, Gregory K., 4,320,399, Cl. 343-17.10R.
Skendrovic, Lawrence, to William M. Bailey Company. Metallurgical processing vessel. 4,319,739, Cl. 266-280.000.
Skiathas, Arthur D.: *See*—
Huckabay, Durward A.; and Skiathas, Arthur D., 4,320,098, Cl. 423-132.000.
Skoda, oborovky podnik: *See*—
Fica, Ladislav; and Cerny, Milos, 4,319,958, Cl. 376-247.000.
Slama, Frank M., to American Can Company. Apparatus for the manufacture of fibrous webs. 4,319,870, Cl. 425-83.100.
Smay, O. Raymond: *See*—
Pataki, William V.; and Smay, O. Raymond, 4,319,728, Cl. 248-154.000.
Smith, Arnold R., to Bell Telephone Laboratories, Incorporated. Method for making cable having a built-in cable shield bonding system. 4,319,939, Cl. 156-56.000.
Smith, Charles F.: *See*—
Panaro, Robert J.; Robbins, Richard W.; and Smith, Charles F., 4,320,376, Cl. 337-252.000.
Smith, Edward W.: *See*—
Kim, Jin K.; Murphy, Clarence R.; and Smith, Edward W., 4,320,210, Cl. 525-57.000.
Smith, Eric G.; and Porteous, David A., to WABCO, Ltd. Hydropneumatic brake actuator arranged to maintain a constant brake shoe clearance. 4,319,671, Cl. 188-196.00A.
Smith, Victor W. Portable saw chain sharpener. 4,319,502, Cl. 76-25.00A.
Smither, Miles A.; and Vela, Octavio A., to Sperry Sun, Inc. Borehole acoustic telemetry clock synchronization system. 4,320,473, Cl. 367-82.000.
SmithKline Corporation: *See*—
DeMarinis, Robert M., 4,320,148, Cl. 424-330.000.
Snamprogetti S.p.A.: *See*—
Pagani, Giorgio, 4,320,103, Cl. 423-359.000.
Snap-on Tools Corporation: *See*—
Henning, Gary S., 4,319,934, Cl. 148-12.00F.
Snavely, Benjamin H.; and Lausch, Henry N., to Sperry Corporation. Forage harvester cutterhead and method of sharpening. 4,319,718, Cl. 241-101.200.
SNIA VISCOSA Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
Lambertini, Giorgio; and Sala, Gianfranco, 4,319,848, Cl. 366-136.000.
Snyder, Charles E.; and Elston, Colin, to Dexter Corporation, The. Nonwoven web material for medical towels and the like. 4,319,956, Cl. 162-146.000.
Snyder, David E., to U.S. Industries, Inc. Self-contained safety system. 4,319,603, Cl. 137-492.500.
Societa Italina Telecomunicazioni Siemens S.p.A.: *See*—
Biggiogera, Giancarlo; and Saba, Manlio, 4,320,265, Cl. 179-170.00R.
Societe Anonyme Automobiles Citroen: *See*—
Barthelemy, Andre J., 4,319,672, Cl. 192-0.02R.
Societe Anonyme D.B.A.: *See*—
Debrus, Philippe, 4,319,609, Cl. 137-625.630.
Societe Anonyme dite: Alsthom-Atlantique: *See*—
Anton, Alain, 4,320,177, Cl. 428-675.000.
Societe Anonyme dite: Les Cables de Lyons: *See*—
Vives, Jean-Patrick, 4,319,938, Cl. 156-49.000.
S.A. Douaisienne de Transformateurs Electriques de Mesure: *See*—
Avocat, Jean P., 4,320,311, Cl. 307-147.000.
Societe Anonyme Francaise Du Ferodo: *See*—
Moulene, Jean-Louis; and Bouvot, Jean-Francois, 4,319,714, Cl. 236-99.00G.
Societe Anonyme ROLBA: *See*—
Jaffrennou, Bernard; and Cessou, Maurice, 4,319,858, Cl. 405-68.000.
Societe Chimique des Charbonnages-CDF Chimie: *See*—
Nicco, Adrien, 4,320,088, Cl. 422-134.000.
Societe d'Etude du Radant: *See*—
Chekroun, Claude, 4,320,404, Cl. 343-854.000.
Societe en nom collectif dite: Calmettes, Marchou & Cie: *See*—
Marchou, Jacques R., 4,319,385, Cl. 24-20.00R.
Societe Europeenne de Propulsion: *See*—
Heidmann, Richard; and Thieck, Jacques P., 4,320,358, Cl. 372-90.000.
Societe Nationale de l'Amionte: *See*—
Aitcin, Pierre C., 4,320,022, Cl. 252-62.590.
Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See*—
Burdet, Michel, 4,320,484, Cl. 368-239.000.
Vuilleumier, Cyril, 4,320,483, Cl. 368-236.000.
Soejima, Masami: *See*—
Morihara, Kazuyuki; Oka, Tatsushi; Soejima, Masami; and Masaki, Takeharu, 4,320,197, Cl. 435-70.000.
Soeno, Ko: *See*—
Tanabe, Masanori; Shimada, Satoshi; Yasukawa, Akio; Nemoto, Hideyuki; Nishihara, Motohisa; Tsuchiya, Masatoshi; and Soeno, Ko, 4,319,397, Cl. 29-589.000.
Sogi, Toshiyuki: *See*—
Motomura, Kenichi; Watanabe, Shigeo; and Sogi, Toshiyuki, 4,319,621, Cl. 152-362.0CS.
Solamat Inc.: *See*—
Narasimhan, Mandayam C.; Roessler, Barton; and Loferski, Joseph J., 4,320,251, Cl. 136-256.000.
Solarex Corporation: *See*—
Lindmayer, Joseph, 4,320,168, Cl. 428-332.000.
Someno, Noboru: *See*—
Maeda, Hidetoshi; Inoue, Kazuo; and Someno, Noboru, 4,320,529, Cl. 455-158.000.
Somers, Gerardus H. J., to U.S. Philips Corporation. Multitrack thin-film magnetic head with stacked electric leads. 4,320,428, Cl. 360-123.000.
Sone, Yoshiaki: *See*—
Murata, Shinji; Torigai, Akiyoshi; Morikawa, Teruo; Nakaoka, Masaki; and Sone, Yoshiaki, 4,319,836, Cl. 355-55.000.

Sonnabend, Ferdinand: *See—*
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,319,736, Cl. 251-329.000.
Sony Corp.: *See—*
Maeda, Hidetoshi; Inoue, Kazuo; and Someno, Noboru, 4,320,529, Cl. 455-158.000.
Murayama, Osamu, 4,320,424, Cl. 360-96.500.
Tottori, Kenzo; Akaba, Yukio; and Suganuma, Shunichi, 4,320,254, Cl. 179-1.0VL.
Sou, Teho. Sectional pet cage. 4,319,545, Cl. 119-17.000.
Sousa, Antonio M.: *See—*
Muller, Roberto; and Sousa, Antonio M., 4,319,412, Cl. 36-29.000.
Southern California Gas Company: *See—*
Hughes, R. Lyle, 4,319,628, Cl. 165-39.000.
Southwest Products Co.: *See—*
Hackman, Kenneth V., 4,319,788, Cl. 308-72.000.
Southwick, Everett W.: *See—*
Kallianos, Andrew G.; and Southwick, Everett W., 4,319,585, Cl. 131-275.000.
Spector, George: *See—*
Carrigan, William J.; and Spector, George, 4,319,379, Cl. 15-400.000.
Spence, J. Ronald, to Standard Oil Company (Indiana). Sulfurized-/aminated mixture of ethylene-based polyolefin and polyisobutylene for lubricating oil. 4,320,017, Cl. 252-43.000.
Sperry Corporation: *See—*
Lutes, Charles L., 4,320,341, Cl. 324-248.000.
Snavely, Benjamin H.; and Lausch, Henry N., 4,319,718, Cl. 241-101.200.
Sperry Sun, Inc.: *See—*
Smither, Miles A.; and Vela, Octavio A., 4,320,473, Cl. 367-82.000.
Spiegel, Raymond W.: *See—*
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Dingler, Geoffrey L.; Jarvis, Wilbur W.; and Spiegel, Raymond W., 4,319,599, Cl. 134-104.000.
Spitfire Tool and Machine Co.: *See—*
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Sporlan Valve Company: *See—*
Lange, Harold T.; and Ziegler, Eugene J., 4,320,000, Cl. 210-117.000.
Sprague Electric Company: *See—*
Bemis, Richard A., 4,319,972, Cl. 204-129.430.
Sprecher & Schuh AG: *See—*
Graf, Rudolf; and Sturzenegger, Christian, 4,320,270, Cl. 200-148.00A.
SRI International: *See—*
Brown, Floyd A., Jr.; and Saraf, Dilip G., 4,320,351, Cl. 330-260.000.
Stacey, Gilbert J.: *See—*
Dutta, Anand S.; Gormley, James J.; Hayward, Christopher F.; Morley, John S.; and Stacey, Gilbert J., 4,320,117, Cl. 424-177.000.
Stach, Leonard J., to Velsicol Chemical Corporation. Herbicidal tetrahydrobenzothiazolylimidazolidinones. 4,319,914, Cl. 71-90.000.
Stackhouse, Karl A.: *See—*
Hynes, Roger P.; and Stackhouse, Karl A., 4,320,412, Cl. 357-70.000.
Staerzl, Richard E., to Brunswick Corporation. Energy regulating system. 4,320,335, Cl. 320-59.000.
Staller, Norman D.: *See—*
Ostrowski, John C.; and Staller, Norman D., 4,319,820, Cl. 354-187.000.
Stanadyne, Inc.: *See—*
Moen, Alfred M., 4,319,735, Cl. 251-175.000.
Stanbery, Billy J.: *See—*
Corwin, Rudolph E.; Riemer, Dietrich E.; and Stanbery, Billy J., 4,320,250, Cl. 136-256.000.
Standard Oil Company (Indiana): *See—*
Greenwood, Terence L., 4,320,076, Cl. 264-35.000.
Kempf, Mark F.; Randall, D'Arcy C.; and Walworth, Timothy R., 4,320,452, Cl. 364-200.000.
Pellet, Regis J.; and Bertolacini, Ralph J., 4,319,984, Cl. 208-138.000.
Spence, J. Ronald, 4,320,017, Cl. 252-43.000.
Standard Products Company, The: *See—*
Brenner, Walter, 4,319,942, Cl. 156-72.000.
Staniland, Philip A.: *See—*
Rose, John B.; and Staniland, Philip A., 4,320,224, Cl. 528-125.000.
Stanley Electric Co., Ltd.: *See—*
Ariga, Kazuo; and Yoshida, Mitunari, 4,320,324, Cl. 313-493.000.
Stanley, Philip E.: *See—*
Woods, William E.; Stanley, Philip E.; and Hirsch, Thomas S., 4,320,455, Cl. 364-200.000.
Starace, Jeremia P.: *See—*
Scerbo, Louis J.; and Starace, Jeremia P., 4,320,261, Cl. 179-98.000.
Statton, Gary L.; and Babiec, John S., Jr., to Atlantic Richfield Company. Oxazoline stabilized diphenylmethane diisocyanate-polymethylene polyphenyl isocyanate compositions. 4,320,069, Cl. 260-453.0SP.
Stauffer Chemical Company: *See—*
Freiberg, Ashley H., 4,320,123, Cl. 424-203.000.
Hillebrecht, Wayne R.; and Calderoni, Felice J., 4,319,912, Cl. 71-86.000.
Kempner, Alan L.; and Kaplan, Robert H., 4,319,894, Cl. 55-71.000.
Stearns, Eugene R. Power drill position indicator. 4,319,403, Cl. 33-185.00R.
Steffen, Vincent B. Aspirating panel for grain bins. 4,319,411, Cl. 34-233.000.
Stein, Karl U., to Siemens Aktiengesellschaft. Method for the automatic or semiautomatic distance measurement and focusing of the image of an object onto a focal plane. 4,320,302, Cl. 250-578.000.
Stein, Leonard A.: *See—*
Berard, Louis N.; and Stein, Leonard A., 4,320,380, Cl. 340-39.000.
Sterling Drug Inc.: *See—*
Crounse, Nathan N.; and Heitz, James R., 4,320,140, Cl. 424-283.000.
Stevens, Noel W., to Safe-T Pacific Co. Article holder and dispenser. 4,319,696, Cl. 221-310.000.
Stevenson, Peter A.: *See—*
Janeway, Donald L., III; and Stevenson, Peter A., 4,319,829, Cl. 355-3.0BE.
Stikeleather, Allan. Center-spine mounted tandem cantilevered rolling mill. 4,319,475, Cl. 72-234.000.
Stirk, Gary L., to General Electric Company. Power semiconductor protection circuit with fault detection. 4,320,434, Cl. 361-86.000.
Stockdale, Elmer G.: *See—*
Sietmann, Vernon H.; Stockdale, Steven C.; and Stockdale, Elmer G., 4,319,557, Cl. 126-110.00R.
Stockdale, Steven C.: *See—*
Sietmann, Vernon H.; Stockdale, Steven C.; and Stockdale, Elmer G., 4,319,557, Cl. 126-110.00R.
Storz Instrument Company: *See—*
Bonte, Charles A., 4,319,575, Cl. 128-305.000.
Stotz, Wolf-Gunter: *See—*
Marchioro, Ignazio; and Stotz, Wolf-Gunter, 4,319,522, Cl. 100-162.00B.
Stowe, Michael W.: *See—*
Wyland, Donald J.; and Stowe, Michael W., 4,319,989, Cl. 209-225.000.
Streit, Philip N.; and Leininger, Lyle E. Storage and disposal bin for waste fatty materials. 4,319,762, Cl. 280-79.200.
Strobl, Rupert: *See—*
Mayerbock, Gottfried; Strobl, Rupert; and Seiler, Sebastian, 4,319,415, Cl. 37-67.000.
Strohmeyer, Max: *See—*
Volkamer, Klaus; Lindner, Alfred; Merger, Franz; Wagner, Ulrich; Brunner, Erwin; Sandrock, Gerhard; and Strohmeyer, Max, 4,320,232, Cl. 568-697.000.
Struve, Alfred: *See—*
Hill, Frank; Preuss, Wolfgang; Schindler, Joachim; Schmid, Rolf; and Struve, Alfred, 4,320,195, Cl. 435-55.000.
Sturzenegger, Christian: *See—*
Graf, Rudolf; and Sturzenegger, Christian, 4,320,270, Cl. 200-148.00A.
Stutz, Peter: *See—*
Hamberger, Helmut; Stutz, Peter; Scholz, Dieter; and Fliri, Hans, 4,320,133, Cl. 424-269.000.
Sueoka, Minekazu: *See—*
Onodera, Tamio; Sakai, Tokuji; Yamasaki, Yasuo; Sumitani, Koji; and Sueoka, Minekazu, 4,320,242, Cl. 585-489.000.
Suery, Michel: *See—*
Baudelet, Bernard; Suery, Michel; and Homer, Claude, 4,319,935, Cl. 148-32.000.
Sugalski, Raymond K., to General Electric Company. Electrochemical cell having cast-in-place insulator. 4,320,182, Cl. 429-94.000.
Suganuma, Shunichi: *See—*
Tottori, Kenzo; Akaba, Yukio; and Suganuma, Shunichi, 4,320,254, Cl. 179-1.0VL.
Sugeno, Katsuhiko: *See—*
Hisazumi, Nobuyuki; Funabashi, Shinichiro; and Sugeno, Katsuhiko, 4,320,175, Cl. 428-518.000.
Sugimoto, Hidehiko, to Mitsubishi Denki Kabushiki Kaisha. Speed control system for induction motor. 4,320,332, Cl. 318-798.000.
Sugimoto, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Control system for a transmission for vehicles. 4,319,501, Cl. 74-866.000.
Sugino, Michael D.: *See—*
Lund, Clarence A.; Barron, Edward W.; Holstin, Howard E.; and Sugino, Michael D., 4,319,395, Cl. 29-571.000.
Sugiyama, Ikuto: *See—*
Yatabe, Toshiaki; Suzuki, Nobuo; and Sugiyama, Ikuto, 4,320,169, Cl. 428-333.000.
Sullivan, George; and Nies, James. Navigational aid. 4,319,541, Cl. 116-318.000.
Sulzer Brothers Ltd.: *See—*
Kohl, Karl, 4,319,468, Cl. 66-203.000.
Lehn, Rudolf; and Hintsch, Otto, 4,319,469, Cl. 66-207.000.
Sumitani, Koji: *See—*
Onodera, Tamio; Sakai, Tokuji; Yamasaki, Yasuo; Sumitani, Koji; and Sueoka, Minekazu, 4,320,242, Cl. 585-489.000.
Sumitomo Chemical Company, Limited: *See—*
Fujita, Fumio; Kitamura, Shuji; Tamura, Toshifumi; and Nagase, Tsuneyuki, 4,320,040, Cl. 524-459.000.
Okabe, Takayuki; Mukai, Kunio; and Hirano, Masachika, 4,320,126, Cl. 424-249.000.
Sumitomo Rubber Industries, Ltd.: *See—*
Fujii, Masaru; Kashiwara, Tomokazu; and Yamaguchi, Tetsuo, 4,319,539, Cl. 114-219.000.
Iuchi, Munenori; Iseki, Tsutomu; Takeyama, Yoshinori; and Ohira, Masuhiro, 4,319,622, Cl. 152-362.00R.

Summers, James W.: *See*—
Rabinovitch, Elvira B.; and Summers, James W., 4,320,174, Cl. 428-518.000.

Sun Electric Corporation: *See*—
Farazi, Perry; and Frank, Howard L., 4,320,506, Cl. 371-20.000.

Sun, Evelyn L.; and Sun, Robert J., to Suntex Products, Inc. Acupressure device. 4,319,574, Cl. 128-303.00R.

Sun, Robert J.: *See*—
Sun, Evelyn L.; and Sun, Robert J., 4,319,574, Cl. 128-303.00R.

Sung, Rodney L.: *See*—
Zoleski, Benjamin H.; Hebert, Gayle P.; Sung, Rodney L.; and Scarberry, Robert M., 4,320,016, Cl. 252-42.700.

Suntech, Inc.: *See*—
Angstadt, Howard P., 4,320,032, Cl. 252-455.00R.

Suntex Products, Inc.: *See*—
Sun, Evelyn L.; and Sun, Robert J., 4,319,574, Cl. 128-303.00R.

Suovaniemi, Osmo A.; Ekholm, Pertti; and Partanen, Paul, to Kommanditiytiyhtio Finnpipette Osmo A. Suovaniemi. Micro-cuvette unit for facilitating the identification of samples. 4,319,841, Cl. 356-244.000.

Sutherland, George K.: *See*—
Tucci, Mario A.; and Sutherland, George K., 4,320,010, Cl. 210-662.000.

Suttles, J. Marshall, to Royston Manufacturing Corporation. Sheet metal cabinet. 4,319,793, Cl. 312-257.00R.

Suzuki, Hirotsugu: *See*—
Endo, Tadakazu; Suzuki, Hirotsugu; and Takahashi, Masanori, 4,320,166, Cl. 428-283.000.

Suzuki, Kohji: *See*—
Oda, Yoshio; Morimoto, Takeshi; and Suzuki, Kohji, 4,319,969, Cl. 204-98.000.

Suzuki, Motoaki: *See*—
Taira, Tadaaki; Hirabayashi, Kiyoteru; Ichinose, Hiroyuki; Hirano, Osamu; and Suzuki, Motoaki, 4,320,277, Cl. 219-61.000.

Suzuki, Nobuo: *See*—
Yatabe, Toshiaki; Suzuki, Nobuo; and Sugiyama, Ikuto, 4,320,169, Cl. 428-333.000.

Suzuki, Seigo; Eguchi, Seiji; and Moriya, Yoshiaki, to Tokyo Shibaura Electric Co., Ltd. Apparatus and method for operand fetch control. 4,320,454, Cl. 364-200.000.

Suzuki, Shigenobu; Hayashi, Kooichi; Hayashi, Chiaki; Takagi, Toshiyuki; and Kobayashi, Shigeharu, to Fuji Seiki Machine Works, Ltd. Blasting machine for deburring workpieces. 4,319,435, Cl. 51-421.000.

Suzuki, Shinjiro; Yoshikawa, Tadashi; Otsuki, Tsuguo; Takeda, Masao; Kamoi, Nobuhisa; and Satoh, Kazuo, to Fujitsu Limited. Variable level converter. 4,320,348, Cl. 330-52.000.

Suzuki, Yasuo, to Bridgestone Tire Company, Limited. Pneumatic tire wheel for use in off-road vehicles. 4,319,618, Cl. 152-185.000.

Sweeney, William M., to Texaco Inc. Smoke filter rejuvenation system. 4,319,896, Cl. 55-213.000.

Syntex (U.S.A.) Inc.: *See*—
White, Abraham, deceased; Nestor, John J.; Jones, Gordon H.; and Burton, Pamela M., 4,320,118, Cl. 424-177.000.

Sys-Tec, Inc.: *See*—
Tucci, Mario A.; and Sutherland, George K., 4,320,010, Cl. 210-662.000.

Systron-Donner: *See*—
Hobbs, Larry P.; Morris, Harold D.; and Voelker, Scott F., 4,319,488, Cl. 73-509.000.

Sznopek, John L.; Lostak, Charles; Heisler, Robert W.; Ferraro, Joseph P.; and Kazienko, Henry J., to Manville Service Corporation. Mandrel for making a coupling for rigid pressure pipe. 4,319,950, Cl. 156-475.000.

Taguchi, Shigemitsu: *See*—
Kohga, Masayuki; and Taguchi, Shigemitsu, 4,320,306, Cl. 307-51.000.

Taguchi, Tadashi; Takemoto, Toshihide; Fujikawa, Noboru; and Kohno, Mitsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Photopolymerizable composition containing s-triazine compound. 4,320,189, Cl. 430-288.000.

Taguchi, Tetsuya: *See*—
Iura, Yukio; Yamamichi, Masayoshi; Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, 4,319,814, Cl. 354-33.000.

Taira, Tadaaki; Hirabayashi, Kiyoteru; Ichinose, Hiroyuki; Hirano, Osamu; and Suzuki, Motoaki, to Nippon Kokan Kabushiki Kaisha. Thick welded steel pipe of large diameter and production thereof. 4,320,277, Cl. 219-61.000.

Taiyu Shoji Kabushiki Kaisha: *See*—
Kikuchi, Takefusa, 4,320,006, Cl. 210-369.000.

Tajima, Masahiko; Sagisaka, Yasuo; Kondo, Toshio; and Kobayashi, Akio, to Nippondenso Co., Ltd. Method for preventing overheating of an exhaust purifying device. 4,319,451, Cl. 60-274.000.

Takagi, Nobuo: *See*—
Nagato, Shoin; Takagi, Nobuo; and Obara, Heitara, 4,319,919, Cl. 71-124.000.

Takagi, Toshiyuki: *See*—
Suzuki, Shigenobu; Hayashi, Kooichi; Hayashi, Chiaki; Takagi, Toshiyuki; and Kobayashi, Shigeharu, 4,319,435, Cl. 51-421.000.

Takagi, Yasuo: *See*—
Yoneda, Kenji; Sanezawa, Fumio; Takagi, Yasuo; and Ushijima, Yuji, 4,319,549, Cl. 123-198.00E.

Takahashi, Akio: *See*—
Gobran, Riad H.; Takahashi, Akio; and Reilly, Eugene P., 4,320,036, Cl. 524-14.000.

Takahashi, Fumio: *See*—
Miyaji, Yoshimori; Fujiki, Hirokazu; and Takahashi, Fumio, 4,320,414, Cl. 358-51.000.

Takahashi, Hiroshi: *See*—
Harayama, Hiroshi; Shinkai, Ken; Takahashi, Hiroshi; and Mizusako, Masahiro, 4,320,214, Cl. 525-264.000.

Takahashi, Katumi: *See*—
Muraoka, Hiroshi, 4,319,876, Cl. 433-141.000.

Takahashi, Masanori: *See*—
Endo, Tadakazu; Suzuki, Hirotsugu; and Takahashi, Masanori, 4,320,166, Cl. 428-283.000.

Takahashi, Seiichi: *See*—
Sakamoto, Yukio; Arakawa, Yoshio; and Takahashi, Seiichi, 4,320,364, Cl. 333-167.000.

Takahashi, Tadashi: *See*—
Kobayashi, Sumio; Takahashi, Tadashi; Ino, Hidetoshi; and Sakai, Takami, 4,320,445, Cl. 363-54.000.

Takahashi, Tsunehisa: *See*—
Yano, Shunji; and Takahashi, Tsunehisa, 4,319,930, Cl. 134-10.000.

Takahashi, Yuji. Ironless rotor winding for electric motor, method and machine for making the same. 4,320,319, Cl. 310-266.000.

Takamizawa, Minoru; Shinohara, Toshio; Yamamoto, Yasushi; Tanino, Tasuku; Takano, Kiyoyuki; and Mori, Fumiaki, to Shin-Etsu Chemical Co., Ltd. Organopolysiloxane resin compositions for release papers. 4,320,172, Cl. 428-447.000.

Takano, Kiyoyuki: *See*—
Takamizawa, Minoru; Shinohara, Toshio; Yamamoto, Yasushi; Tanino, Tasuku; Takano, Kiyoyuki; and Mori, Fumiaki, 4,320,172, Cl. 428-447.000.

Takasaki, Yoshitaka, to Hitachi, Ltd. Bit synchronizing system for pulse signal transmission. 4,320,527, Cl. 375-119.000.

Takase, Muneaki: *See*—
Mitsuhashi, Hiroshi; Mizuno, Den-ichi; Hayashi, Koji; Abe, Shigeru; Takase, Muneaki; and Narita, Toshiharu, 4,320,120, Cl. 424-182.000.

Takato, Norio: *See*—
Oikawa, Shigeru; Katayama, Yuzo; Takato, Norio; and Kurokawa, Takashi, 4,320,292, Cl. 250-227.000.

Takeda Chemical Industries, Ltd.: *See*—
Higashide, Eiji; Asai, Mitsuko; and Tanida, Seiichi, 4,320,200, Cl. 435-253.000.

Takeda, Masao: *See*—
Suzuki, Shinjiro; Yoshikawa, Tadashi; Otsuki, Tsuguo; Takeda, Masao; Kamoi, Nobuhisa; and Satoh, Kazuo, 4,320,348, Cl. 330-52.000.

Takeguchi, Masanobu; and Oyobe, Isao, to Marui Industry Co., Ltd. Method of inhibiting and eliminating chlorophyceae in water in tank. 4,320,085, Cl. 422-24.000.

Takei, Yasuharu; Kodama, Yasuharu; Shimoda, Hiroshi; and Ohi, Satoshi, to Fumakilla Limited. Method of enhancing the activity of fast evaporating insecticides. 4,320,139, Cl. 424-282.000.

Takematsu, Tetsuo; and Tsuchiya, Hideshi, to Mitsubishi Gas Chemical Co., Inc.; and Japan Hydrazine. Herbicidal compositions. 4,319,915, Cl. 71-92.000.

Takemoto, Toshihide: *See*—
Taguchi, Tadashi; Takemoto, Toshihide; Fujikawa, Noboru; and Kohno, Mitsuo, 4,320,189, Cl. 430-288.000.

Takemura, Yasuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Solid-state image pick-up device. 4,320,413, Cl. 358-44.000.

Takenaka, Yasuo: *See*—
Sato, Hiroshi; Shigeta, Sadaaki; and Takenaka, Yasuo, 4,320,011, Cl. 210-694.000.

Takeuchi, Takashi; Kaneko, Yoichi; and Owatari, Hisato, to Hitachi, Ltd. Dielectric heating device. 4,320,276, Cl. 219-10.810.

Takeuchi, Yasuhito: *See*—
Yamaguchi, Keiki; Takeuchi, Yasuhito; Shimazaki, Toru; and Seki, Naoki, 4,319,489, Cl. 73-626.000.

Takeyama, Yoshinori: *See*—
Iuchi, Munenori; Iseki, Tsutomu; Takeyama, Yoshinori; and Ohira, Masuhiro, 4,319,622, Cl. 152-362.00R.

Takezoe, Fumihiko, to Fuji Electric Co., Ltd. Self-diagnosing, self-correcting communications network. 4,320,508, Cl. 371-22.000.

Takigawa, Yukio: *See*—
Monta, Kazuo; and Takigawa, Yukio, 4,319,959, Cl. 376-245.000.

Takimoto, Yukio: *See*—
Koga, Keiichiro; Yasuda, Yutaka; Saga, Ryokichi; and Takimoto, Yukio, 4,320,511, Cl. 371-37.000.

Tamai, Yasuo: *See*—
Ogawa, Hiroshi; Nakahara, Hiromi; and Tamai, Yasuo, 4,320,159, Cl. 428-64.000.

Tamiya, Toshio: *See*—
Iwamura, Tadaaki; and Tamiya, Toshio, 4,319,479, Cl. 73-19.000.

Tamura, Toshifumi: *See*—
Fujita, Fumio; Kitamura, Shuji; Tamura, Toshifumi; and Nagase, Tsuneyuki, 4,320,040, Cl. 524-459.000.

Tanabe, Masanori; Shimada, Satoshi; Yasukawa, Akio; Nemoto, Hideyuki; Nishihara, Motohisa; Tsuchiya, Masatoshi; and Soeno, Ko, to Hitachi, Ltd. Method of producing semiconductor displacement transducer. 4,319,397, Cl. 29-589.000.

Tanaka, Norio: *See*—
Sato, Masahiro; and Tanaka, Norio, 4,319,785, Cl. 301-6.0CS.

Tanida, Seiichi: *See*—
Higashide, Eiji; Asai, Mitsuko; and Tanida, Seiichi, 4,320,200, Cl. 435-253.000.

Taniguchi, Harutaka; Hara, Kenichi; Shiraishi, Hideo; and Kiyofuji, Shinji, to Fuji Electric Co. Ltd. Oxygen sensor. 4,320,378, Cl. 338-34.000.

Taniguchi, Kazunori: *See—*
Tomiyama, Muneo; Mizugane, Keiichi; Taniguchi, Kazunori; Nonaka, Toshio; and Oodoi, Hidenori, 4,319,698, Cl. 222-129.100.

Tanikawa, Roy K., to General Automation, Inc. Communication bus acquisition circuit. 4,320,457, Cl. 364-200.000.

Tanino, Tasuku: *See—*
Takamizawa, Minoru; Shinohara, Toshio; Yamamoto, Yasushi; Tanino, Tasuku; Takano, Kiyoyuki; and Mori, Fumiaki, 4,320,172, Cl. 428-447.000.

Tanzawa, Misao: *See—*
Sakamoto, Koji; Hayashi, Masayuki; Koizumi, Yutaka; and Tanzawa, Misao, 4,319,832, Cl. 355-15.000.

Tarpley, Roy W.: *See—*
Durham, Kenneth M., Jr.; Tarpley, Roy W.; and Rehn, Larry A., 4,319,483, Cl. 73-204.000.

Tarrson, Emanuel B.; and Maric, Dane, to John O. Butler Company. Interproximal toothbrush. 4,319,377, Cl. 15-111.000.

Tasseron, Frans A. W., to Koninklijke Emballage Industrie Van Leer B.V. Method and tool for producing a bushing structure having a polygonal flange. 4,319,477, Cl. 72-352.000.

Tausig, Wayne R., to United States of America, Navy. Submarine rescue cable reel. 4,319,372, Cl. 441-25.000.

Taylor, Byron K.: *See—*
Riddle, George H. N.; and Taylor, Byron K., 4,320,490, Cl. 369-126.000.

Taylor, G. Bruce: *See—*
Scharton, Terry D.; and Taylor, G. Bruce, 4,320,528, Cl. 376-310.000.

TDK Electronics Company, Ltd.: *See—*
Itou, Tomio; and Kitagawa, Toshiyuki, 4,320,370, Cl. 335-208.000.
Yodogawa, Masatada, 4,320,379, Cl. 338-21.000.

Technicolor Corporation: *See—*
Williams, Albert M., 4,319,812, Cl. 352-31.000.

Teijin Limited: *See—*
Yatabe, Toshiaki; Suzuki, Nobuo; and Sugiyama, Ikuto, 4,320,169, Cl. 428-333.000.

Teijin Petrochemical Industries Ltd.: *See—*
Onodera, Tamio; Sakai, Tokuji; Yamasaki, Yasuo; Sumitani, Koji; and Sueoka, Minekazu, 4,320,242, Cl. 585-489.000.

Telecommunications Radioelectriques et Telephoniques T.R.T.: *See—*
Bellanger, Maurice G.; and Gaillard, Jean, 4,320,362, Cl. 333-165.000.

Teller, Aaron J.; and Roy, Denis R. J., to Teller Environmental Systems, Inc. Dry impact capture of aerosol particulates. 4,319,890, Cl. 55-1.000.

Teller Environmental Systems, Inc.: *See—*
Teller, Aaron J.; and Roy, Denis R. J., 4,319,890, Cl. 55-1.000.

Temple, Davis L., Jr.; Yevich, Joseph P.; and Lobeck, Walter G., Jr., to Mead Johnson & Company. N-(4-Pheny-1,2,3,6-tetrahydropyridin-1-yl)alkylene]azaspiroalkanediones and N-[(4-hydroxy-4-phenylpiperidin-1-yl]alkylene)azaspiroalkanediones. 4,320,131, Cl. 424-267.000.

Te Raa, Gerhardus A.: *See—*
Magendans, Frederik; Te Raa, Gerhardus A.; and van Rheenen, Bernhard J., 4,320,323, Cl. 313-330.000.

Terada, Jiro; and Nitta, Tsuneharu, to Matsushita Electric Industrial Co., Ltd. Temperature-humidity detecting apparatus. 4,319,485, Cl. 73-336.000.

Ternstrom, Maj I.: *See—*
Widlund, Leif U. R.; and Ternstrom, Maj I., 4,319,572, Cl. 128-284.000.

Terrill, Kenneth P. Subtractive color printing device. 4,319,834, Cl. 355-35.000.

Texaco Inc.: *See—*
Kudchadker, Mohan V.; and Whittington, Lawrence E., 4,319,636, Cl. 166-274.000.
Langford, Obie M.; and Richter, Albert P., Jr., 4,320,446, Cl. 363-59.000.
Love, Richard F.; Dorawala, Tansukhlal G.; and Kerr, Edwin R., 4,320,240, Cl. 585-419.000.
Pogonowski, Ivo C., 4,319,393, Cl. 29-434.000.
Sweeney, William M., 4,319,896, Cl. 55-213.000.
Yaffe, Roberta, 4,320,018, Cl. 252-46.700.
Zoleski, Benjamin H.; Hebert, Gayle P.; Sung, Rodney L.; and Scarberry, Robert M., 4,320,016, Cl. 252-42.700.

Texas Instruments Incorporated: *See—*
Durham, Kenneth M., Jr.; Tarpley, Roy W.; and Rehn, Larry A., 4,319,483, Cl. 73-204.000.
Myers, Dewey R., 4,320,466, Cl. 364-900.000.

Tezuka, Nobuo; and Hirohata, Michio, to Canon Kabushiki Kaisha. Shutter blades for camera. 4,319,821, Cl. 354-230.000.

Tezuka, Nobuo; and Hirohata, Michio, to Canon Kabushiki Kaisha. Electromagnetically operated shutter. 4,319,822, Cl. 354-234.000.

Thalenfeld, David R., to Trion Industries Inc. Self-locking merchandise hook. 4,319,730, Cl. 248-220.400.

Theobald, Hans; Adolphi, Heinrich; Eicken, Karl; and Oeser, Heinz-Guenter, to BASF Aktiengesellschaft. 6-Fluoropyridyl-(di)(thio)-phosphoric acid esters. 4,320,122, Cl. 424-200.000.

Thermo Electron Corporation: *See—*
Schlarlack, Ronald S., 4,320,288, Cl. 250-203.00R.

Thiebaut, Georges: *See—*
Le Dieu, Bernard; and Thiebaut, Georges, 4,320,501, Cl. 370-63.000.

Thieck, Jacques P.: *See—*
Heidmann, Richard; and Thieck, Jacques P., 4,320,358, Cl. 372-90.000.

Thiele, Karl-Heinz, to Licentia Patent-Verwaltungs GmbH. Dynamic transducer with moving coil in an air gap filled with magnetic liquid. 4,320,263, Cl. 179-115.5VC.

Thissen, Christopher P.; Ferwerda, Jerry J.; Tweet, Milford J.; and Hatfield, Ronald D., to Walker Process Corporation. Machine for heat sealing polymeric sheets into a spiral drum. 4,319,949, Cl. 156-446.000.

Thomas, Friedrich W., to Leybold Heraeus GmbH. Method and voltage source for producing a smoothed voltage from three-phase current. 4,320,305, Cl. 307-6.000.

Thomas, Robert M., to Hazeltine Corporation. Current pulse-injected, phase-locked oscillator. 4,320,360, Cl. 331-172.000.

Thompson, Dale J.: *See—*
Haase, Wayne C.; and Thompson, Dale J., 4,319,487, Cl. 73-384.000.

Thompson, Gerald L.: *See—*
Miller, Jean C.; and Thompson, Gerald L., 4,320,058, Cl. 260-244.400.

Thompson, Herbert E., to Xerox Corporation. Head assembly for recording on magnetic disc. 4,320,426, Cl. 360-104.000.

Thompson, Stanley C. Metal shell golf club head, with keel. 4,319,752, Cl. 273-171.000.

Thomson-CSF: *See—*
Gloanec, Maurice; and Castagne, Rene, 4,320,313, Cl. 307-243.000.
Leclerc, Pierre; Huignard, Jean-Pierre; Papuchon, Michel; and Puech, Claude, 4,320,475, Cl. 367-149.000.
Pham, Ngu T., 4,320,314, Cl. 307-288.000.

Thomson, George A. Water lubricated sleeve bearings. 4,319,790, Cl. 308-238.000.

Thuries, Edmond; Sadoulet, Jean-Paul; and Sanchez, Alain, to Alsthom-Atlantique. Current transformer for a high-tension installation. 4,320,372, Cl. 336-92.000.

Thurlo, Carl C. Fireplace heater. 4,319,558, Cl. 126-121.000.

Thyssen Industrie AG: *See—*
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,319,736, Cl. 251-329.000.

Tiefenthaler, Karl H. O.; and Wyss, Ulrich, to Meyhall Chemical A.G. Water soluble guar product and method for making it. 4,320,226, Cl. 536-114.000.

TII Industries, Inc.: *See—*
Jones, Raymond D., 4,320,435, Cl. 361-119.000.

Tokieda, Akinori: *See—*
Kozima, Masatoshi; Tokieda, Akinori; Nagumo, Tadanobu; and Hirai, Masaru, 4,319,619, Cl. 152-209.00R.

Toko Kabushiki Kaisha: *See—*
Sakai, Koichi; and Horie, Satoru, 4,320,534, Cl. 455-267.000.

Tokuno, Masateru, to Rengo Kabushiki Kaisha (Rengo Co., Ltd.). Single facer with automatic roll gap control system. 4,319,947, Cl. 156-351.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Kobayashi, Sumio; Takahashi, Tadashi; Ino, Hidetoshi; and Sakai, Takami, 4,320,445, Cl. 363-54.000.
Kojima, Tadashi, 4,320,510, Cl. 371-37.000.
Miyaji, Yoshimori; Fujiki, Hirokazu; and Takahashi, Fumio, 4,320,414, Cl. 358-51.000.
Monta, Kazuo; and Takigawa, Yukio, 4,319,959, Cl. 376-245.000.
Mori, Hideyasu; and Kishikawa, Eizo, 4,320,497, Cl. 370-14.000.
Takemura, Yasuo, 4,320,413, Cl. 358-44.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Suzuki, Seigo; Eguchi, Seiji; and Moriya, Yoshiaki, 4,320,454, Cl. 364-200.000.

Tomita, Koji; Tsukiura, Hiroshi; and Kawaguchi, Hiroshi, to Bristol-Myers Company. Fermentation process for producing nocardicins A and B. 4,320,199, Cl. 435-121.000.

Tomiyama, Muneo; Mizugane, Keiichi; Taniguchi, Kazunori; Nonaka, Toshio; and Oodoi, Hidenori, to Kubota Ltd. Automatic cup drink vending machine. 4,319,698, Cl. 222-129.100.

Tomiyasu, Kunihiko: *See—*
Ueno, Ryuzo; Kanayama, Tatsuo; Matsuda, Toshio; Tomiyasu, Kunihiko; and Inamine, Shigeo, 4,320,153, Cl. 426-643.000.

Topley, Trevor E.: *See—*
Bleiweiss, Arthur F.; Wilkes, Robert J.; and Topley, Trevor E., 4,320,385, Cl. 340-133.000.

Topor, Michael G.: *See—*
Hilton, Barney W.; Lin, Robert I.; and Topor, Michael G., 4,320,009, Cl. 210-651.000.

Toray Industries, Inc.: *See—*
Endo, Tsdakazu; Suzuki, Hirotsugu; and Takahashi, Masanori, 4,320,166, Cl. 428-283.000.
Nishimura, Akira; and Nishimura, Kyuichiro, 4,320,160, Cl. 428-107.000.

Toray Silicone Company, Ltd.: *See—*
Nakamura, Akito, 4,320,044, Cl. 524-413.000.

Torigai, Akiyoshi: *See—*
Murata, Shinji; Torigai, Akiyoshi; Morikawa, Teruo; Nakaoka, Masaki; and Sone, Yoshiaki, 4,319,836, Cl. 355-55.000.

Totten, David S., to Allis-Chalmers Corporation. Variable speed plow with moldboard pivoting about a forward vertical pivot axis. 4,319,645, Cl. 172-664.000.

Tottori, Kenzo; Akaba, Yukio; and Suganuma, Shunichi, to Sony Corporation. Volume control apparatus. 4,320,254, Cl. 179-1.0VL.

Tourrier, Herve ' : *See—*
Porta, Augusto; Kulhanek, Antonin; Groult, Alain; and Tourrier, Herve ' , 4,319,973, Cl. 204-133.000.

Toyota Jidosha Kogya Kabushiki Kaisha: *See—*
Shinto, Hiroaki; and Yamada, Shigemichi, 4,319,497, Cl. 74-512.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Motonami, Masanao; Yasumatsu, Jun; and Tsujiuchi, Yoshio, 4,319,667, Cl. 188-65.100.
Nogami, Tomoyuki, 4,319,786, Cl. 303-6.00C.
Oka, Hiroyuki; Watanabe, Shingo; Watanabe, Yusyo; and Kurata, Masayuki, 4,319,670, Cl. 188-73.340.
Sanui, Yoshio; Wakahara, Kaoru; and Yasui, Yasuyoshi, 4,319,499, Cl. 74-700.000.
Sugimoto, Hiroshi, 4,319,501, Cl. 74-866.000.

Traill, Gerald L. Molded picture frame with attachable displays. 4,319,419, Cl. 40-152.100.

Transport, Felix, to Transport, Felix. Collapsible ornamental solids. 4,319,418, Cl. 40-124.100.

Traub, Karl: *See—*
Volejnik, Wilhelm; Kuenemund, Friedrich; Traub, Karl; and Albsmeier, Hans, 4,320,366, Cl. 333-197.000.

Tregoning, John A., to Vickers Limited. Liquid dispensing apparatus. 4,319,568, Cl. 128-214.00F.

Trentham Corporation: *See—*
Trentham, H. Lee; Crow, John H.; and Boston, Farwell C., 4,320,101, Cl. 423-243.000.

Trentham, H. Lee; Crow, John H.; and Boston, Farwell C., to Trentham Corporation. Removal of sulfur from waste gas streams. 4,320,101, Cl. 423-243.000.

Tri Tool Inc.: *See—*
Saine, Thomas W.; and Pertle, John E., 4,319,503, Cl. 82-4.00C.

Triangle PWC, Inc.: *See—*
Bernat, Charles A., 4,319,800, Cl. 339-218.00R.

Trion Industries Inc.: *See—*
Thalenfeld, David R., 4,319,730, Cl. 248-220.400.

Triplett, Gregory L.: *See—*
Wulfsberg, Paul G.; Fredrickson, Dennis L.; Triplett, Gregory L.; Crumrine, Ralph J.; and Cunningham, Cole E., 4,320,357, Cl. 331-16.000.

Trippensee Corporation: *See—*
Deja, Edmund P., 4,319,486, Cl. 73-343.00B.

TRW Inc.: *See—*
Irwin, Arthur S., 4,319,789, Cl. 308-207.00R.

Tsezos, Marios: *See—*
Volesky, Bohumil; and Tsezos, Marios, 4,320,093, Cl. 423-6.000.

Tsuchiya, Hideshi: *See—*
Takematsu, Tetsuo; and Tsuchiya, Hideshi, 4,319,915, Cl. 71-92.000.

Tsuchiya. Masatoshi: *See—*
Tanabe, Masanori; Shimada, Satoshi; Yasukawa, Akio; Nemoto, Hideyuki; Nishihara, Motohisa; Tsuchiya, Masatoshi; and Soeno, Ko, 4,319,397, Cl. 29-589.000.

Tsuge, Kenji. Bicycle seat cover. 4,319,781, Cl. 297-214.000.

Tsujiuchi, Yoshio: *See—*
Motonami, Masanao; Yasumatsu, Jun; and Tsujiuchi, Yoshio, 4,319,667, Cl. 188-65.100.

Tsukiura, Hiroshi: *See—*
Tomita, Koji; Tsukiura, Hiroshi; and Kawaguchi, Hiroshi, 4,320,199, Cl. 435-121.000.

Tsuruoka, Mitsuo: *See—*
Abe, Katsuhiro; Tsuruoka, Mitsuo; Kiriyama, Shigeki; and Nakamori, Kazunobu, 4,320,041, Cl. 524-503.000.

Tsutsumi, Masataka: *See—*
Davis, William F.; and Tsutsumi, Masataka, 4,319,992, Cl. 209-275.000.

Tsuzuki, Hiroshige: *See—*
Morihara, Kazuyuki; Oka, Tatsushi; and Tsuzuki, Hiroshige, 4,320,196, Cl. 435-70.000.

Tu, Shu-Tung; and Lorenz, Donald H., to GAF Corporation. Abrasion resistance radiation curable coating. 4,319,811, Cl. 351-166.000.

Tubis, Manuel: *See—*
Wolf, Walter; Nakamura, Robert M.; Gokce, Ata; Tubis, Manuel; and O'Brien, Timothy J., 4,320,109, Cl. 424-1.000.

Tucci, Mario A.; and Sutherland, George K., to Sys-Tec, Inc. Regeneration detector for water softeners. 4,320,010, Cl. 210-662.000.

Turnbough, Harold L., to Alvey, Inc. Roller conveyor. 4,319,675, Cl. 198-367.000.

Turnbough, Harold L., to Alvey Inc. Article combiner conveyor apparatus. 4,319,676, Cl. 198-449.000.

Tweet, Milford J.: *See—*
Thissen, Christopher P.; Ferwerda, Jerry J.; Tweet, Milford J.; and Hatfield, Ronald D., 4,319,949, Cl. 156-446.000.

Tyler, Derek E.: *See—*
Kindlmann, Peter J.; Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., 4,319,625, Cl. 164-467.000.

Uchiyama, Takashi: *See—*
Iura, Yukio; Yamamichi, Masayoshi; Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, 4,319,814, Cl. 354-33.000.

Ueda, Yutaka, to Murata Kikai Kabushiki Kaisha. Yarn knotting operation control apparatus in automatic winder. 4,319,720, Cl. 242-35.50R.

Ueno, Atsuyuki; and Yokota, Junichiro, to Okubo, Katsuhiro. Electrolytically decomposing method for iron-cyanide complex. 4,319,968, Cl. 204-96.000.

Ueno, Kouji: *See—*
Fukushima, Toshitaka; Koyama, Kazumi; and Ueno, Kouji, 4,320,507, Cl. 371-21.000.

Ueno, Ryuzo; Kanayama, Tatsuo; Matsuda, Toshio; Tomiyasu, Kunihiko; and Inamine, Shigeo, to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo. Method for producing refrigerated ground flesh of fish of high elasticity. 4,320,153, Cl. 426-643.000.

Ujita, Tuginobu, to Kubota, Ltd. Tractor steering mechanism. 4,319,654, Cl. 180-155.000.

Ulrich, Rex. Dental care unit. 4,319,595, Cl. 132-92.00R.

Ulseth, John W., to Minnesota Mining and Manufacturing Company. Sheet feeder. 4,319,740, Cl. 271-22.000.

Ulseth, John W., to Minnesota Mining and Manufacturing Company. Sheet supply detector and indicator. 4,319,742, Cl. 271-118.000.

Umezawa, Kazumi: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,319,828, Cl. 355-3.00R.

Ungarean, Gary L.: *See—*
Kindlmann, Peter J.; Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., 4,319,625, Cl. 164-467.000.

Unger, Herbert: *See—*
Gross, Friedrich; Meise, Guenther; and Unger, Herbert, 4,319,457, Cl. 60-593.000.

Union Carbide Corporation: *See—*
Kaplan, Leonard, 4,320,063, Cl. 260-404.500.
Keogh, Michael J., 4,320,038, Cl. 523-216.000.
Murphy, Gerald J., 4,320,231, Cl. 568-494.000.
Vidal, Jose' L., 4,320,064, Cl. 260-429.00R.
Young, Frank G., 4,320,229, Cl. 568-484.000.

United Aircraft Products, Inc.: *See—*
Hronek, George; and Gooden, Richmond A., 4,319,630, Cl. 165-70.000.

United Geophysical Corporation: *See—*
Fort, J. Robert, 4,320,472, Cl. 367-79.000.

U.S. Industries, Inc.: *See—*
Snyder, David E., 4,319,603, Cl. 137-492.500.

United States of America
Air Force: *See—*
Abel, Irving R., 4,319,809, Cl. 350-464.000.
Durran, Donald A., 4,319,839, Cl. 356-153.000.
Healey, Daniel J., III, 4,320,346, Cl. 329-101.000.
Perdue, Edward M., 4,320,356, Cl. 331-11.000.
Peterson, Phillip R.; Gavrielides, Athanasios; and Erkkila, John H., 4,320,359, Cl. 372-18.000.
Schultz, Edwin R., 4,319,723, Cl. 244-122.00A.
Army: *See—*
Bishop, Charles R., 4,319,660, Cl. 181-222.000.
Brobeil, Karl R., 4,319,640, Cl. 169-28.000.
Hartmann, Henry, Jr., 4,319,490, Cl. 73-642.000.
Energy: *See—*
Singerman, Gary M., 4,319,981, Cl. 208-8.00R.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Constantinides, Nick J. Echo tracker/range finder for radars and sonars. 4,320,397, Cl. 343-7.500.
Frazer, Robert E. Constant magnification optical tracking system. 4,320,290, Cl. 250-216.000.
Navy: *See—*
Huckabay, John M.; and Wallace, Reuben H., 4,320,474, Cl. 367-138.000.
Tausig, Wayne R., 4,319,372, Cl. 441-25.000.
White, Jack R.; Godwin, Charles L.; and Blattel, Raymond J., 4,320,289, Cl. 250-214.00R.

U.S. Philips Corporation: *See—*
Heinzerling, Jurgen, 4,320,342, Cl. 324-319.000.
Hermann, Wilhelm; and Horster, Horst, 4,319,559, Cl. 126-442.000.
Howden, Harry, 4,319,945, Cl. 156-212.000.
Lauer, Reinhard, 4,319,716, Cl. 239-102.000.
Magendans, Frederik; Te Raa, Gerhardus A.; and van Rheenen, Bernhard J., 4,320,323, Cl. 313-330.000.
Muilwijk, Dirk; Dekker, Cornelis B.; and de Jager, Frank, 4,320,499, Cl. 375-17.000.
Somers, Gerardus H. J., 4,320,428, Cl. 360-123.000.

United Technologies Corporation: *See—*
Black, James F.; Courtney, Richard A.; Grudkowski, Thomas W.; Norusis, Philip T.; and Wood, Harry R., 4,320,365, Cl. 333-187.000.

University of Adelaide: *See—*
Shaw, Allan, 4,319,461, Cl. 62-93.000.

University of California, The Regents of the: *See—*
Osada, Yoshihito; Bell, Alexis T.; and Shen, Mitchel M., 4,320,219, Cl. 528-4.0AD.

University of Delaware: *See—*
Austin, Paul R.; Zikakis, John P.; and Brine, Charles J., 4,320,150, Cl. 426-2.000.

University of Illinois Foundation: *See—*
Holonyak, Nick; and Rezek, Edward A., 4,319,937, Cl. 148-171.000.

University of Southern California, The: *See—*
Wolf, Walter; Nakamura, Robert M.; Gokce, Ata; Tubis, Manuel; and O'Brien, Timothy J., 4,320,109, Cl. 424-1.000.

University of Virginia Alumni Patents Foundation, The: *See—*
Crosby, Ivan K., 4,319,562, Cl. 128-1.00R.

University of Washington, The Board of Regents of the: *See—*
Colley, Peter S.; and Martin, Roy W., 4,319,580, Cl. 128-661.000.

UOP Inc.: *See—*
Fickel, R. Gene, 4,319,929, Cl. 127-46.200.
Frame, Robert R., 4,320,029, Cl. 252-428.000.
Kulprathipanja, Santi; and Neuzil, Richard W., 4,319,928, Cl. 127-46.200.
Uramoto, Hiromu, to Yuasa Battery Company Limited. Optical instrument. 4,320,291, Cl. 250-227.000.
Ushijima, Yuji: *See—*
Yoneda, Kenji; Sanezawa, Fumio; Takagi, Yasuo; and Ushijima, Yuji, 4,319,549, Cl. 123-198.00E.
Uskokovic, Milan R.: *See—*
Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., 4,320,056, Cl. 260-239.30T.
USM Corporation: *See—*
Lauckhardt, Gerhard; Fichtner, Rudi; and Broning, Manfred, 4,319,373, Cl. 12-8.300.
Vancelette, Stanley R., 4,320,339, Cl. 324-73.0AT.
Valmet Oy: *See—*
Koskivirta, Veikko, 4,319,540, Cl. 114-260.000.
Vancelette, Stanley R., to USM Corporation. Component testing station. 4,320,339, Cl. 324-73.0AT.
van den Houten, Gerardus J.: *See—*
Engelbrecht, Andre D.; and van den Houten, Gerardus J., 4,320,100, Cl. 423-219.000.
Vandriak, Walter J.: *See—*
Meuschke, Robert E.; and Vandriak, Walter J., 4,319,725, Cl. 248-68.00R.
Van Fossen, Harvey G., to Wheelabrator-Frye, Inc. Portable blasting device and sealing means. 4,319,436, Cl. 51-424.000.
Van Landeghem, Hugo: *See—*
Chauvin, Yves; Gaillard, Jean; Leger, Gerard; and Van Landeghem, Hugo, 4,320,243, Cl. 585-521.000.
van Rheenen, Bernhard J.: *See—*
Magendans, Frederik; Te Raa, Gerhardus A.; and van Rheenen, Bernhard J., 4,320,323, Cl. 313-330.000.
Varker, Alan E.: *See—*
Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; and Clark, William D. K., 4,320,185, Cl. 429-217.000.
Varrone, Piergiorgio: *See—*
Giovinazzo, Giovanni; and Varrone, Piergiorgio, 4,320,392, Cl. 340-365.00C.
Vasicek, Vladimir: *See—*
Foltyn, Jan; Kuda, Vladimir; Vasicek, Vladimir; and Koci, Jaroslav, 4,319,611, Cl. 139-435.000.
Vaughan, Ronald J., to Chevron Research Company. Magnesium salts of N-carboxyamino acid. 4,320,015, Cl. 252-33.600.
VDO Adolf Schindling AG: *See—*
Collonia, Harald; Mann, Arnold; and Haub, Martin, 4,319,658, Cl. 180-271.000.
Hofert, Paul, 4,320,481, Cl. 368-190.000.
Veb Kombinat Polygraph "Werner Lamberz" Leipzig: *See—*
Nagel, Hartmut; Zimmermann, Hans; Pieper, Fritz; and Plage, Dieter, 4,319,744, Cl. 271-222.000.
Vela, Octavio A.: *See—*
Smither, Miles A.; and Vela, Octavio A., 4,320,473, Cl. 367-82.000.
Velic, Milan: *See—*
Motz, Herbert; Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Hartmann, Hans-Joerg; Frischmann, Harald; Falk, Roland; Hack, Joachim; Velic, Milan; and Kopke, Helmut, 4,320,171, Cl. 428-423.100.
Velsicol Chemical Corporation: *See—*
Stach, Leonard J., 4,319,914, Cl. 71-90.000.
Vercruysse, George M., Jr. Metal recovery apparatus. 4,319,394, Cl. 29-564.400.
Vereinigte Edelstahlwerke Aktiengesellschaft: *See—*
Mayerbock, Gottfried; Strobl, Rupert; and Seiler, Sebastian, 4,319,415, Cl. 37-67.000.
Versey, Peter F. Image recording system. 4,319,801, Cl. 350-19.000.
Vianova Kunstharz, A.G.: *See—*
Pampouchidis, Georgios, 4,320,220, Cl. 524-591.000.
Vibranetics, Inc.: *See—*
Rudolph, Kenneth E., Jr., 4,320,328, Cl. 318-431.000.
Vicens, Miguel F. Well swab cups. 4,319,518, Cl. 92-241.000.
Vickers Limited: *See—*
Tregoning, John A., 4,319,568, Cl. 128-214.00F.
Vidal, Jose' L., to Union Carbide Corporation. Polynuclear rhodium carbonyl complexes. 4,320,064, Cl. 260-429.00R.
Villalobos, Humberto F. Ultrasharp diamond edges and points and methods of making same by precision micro-irradiation techniques. 4,319,889, Cl. 51-307.000.
Vinals, Joaquin F.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Granda, Edward J.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,319,586, Cl. 131-276.000.
Vincent, Monty E.; and Vizulis, Karlis, to Gelman Sciences, Inc. Filter with initially flat membrane and curved membrane support. 4,319,996, Cl. 210-188.000.
Vincent, Philippe, to Schlumberger Technology Corporation. Well log processing technique. 4,320,458, Cl. 364-422.000.
Visan, Michel; and Isfan, Lydia, to Siare-Societe Industrielle d'Applications/Radio-Electriques. Loudspeaker with a heat resistant two-part diaphragm. 4,320,264, Cl. 179-115.50R.
Vives, Jean-Patrick, to Societe Anonyme dite: Les Cables de Lyons. Method of butt-jointing metal tapes coated with a thermoplastic polymer film. 4,319,938, Cl. 156-49.000.
Vivian, Thomas A., to Dow Chemical Company, The. Acidification of subterranean formations employing halogenated hydrocarbons. 4,320,014, Cl. 252-8.55C.
Vizulis, Karlis: *See—*
Vincent, Monty E.; and Vizulis, Karlis, 4,319,996, Cl. 210-188.000.
Vock, Manfred H.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Granda, Edward J.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,319,586, Cl. 131-276.000.
Voelker, Scott F.: *See—*
Hobbs, Larry P.; Morris, Harold D.; and Voelker, Scott F., 4,319,488, Cl. 73-509.000.
Voges, Kenneth. Grain trailer and bin. 4,319,863, Cl. 414-480.000.
Vogt, Noland E., to Memorex Mini Disc Drive Corporation. Recording disc cartridge closure mechanism. 4,320,430, Cl. 360-133.000.
Voigt, Carl: *See—*
Bittner, Friedrich; Voigt, Carl; and Kleinschmit, Peter, 4,320,104, Cl. 423-375.000.
Voigt, Gottfried, to Braun AG. Blow dryer with heater inside stand. 4,320,283, Cl. 219-369.000.
Voith Getriebe KG: *See—*
Zaiser, Wolfgang; and Elsner, Ernst, 4,319,466, Cl. 64-27.00L.
Volejnik, Wilhelm; Kuenemund, Friedrich; Traub, Karl; and Albsmeier, Hans, to Siemens Aktiengesellschaft. Carrier frequency communication transmission system having premodulation. 4,320,366, Cl. 333-197.000.
Volesky, Bohumil; and Tsezos, Marios. Separation of uranium by biosorption. 4,320,093, Cl. 423-6.000.
Volkamer, Klaus; Lindner, Alfred; Merger, Franz; Wagner, Ulrich; Brunner, Erwin; Sandrock, Gerhard; and Strohmeyer, Max, to BASF Aktiengesellschaft. Process for conjointly preparing methyl tert.-butyl ether and obtaining isobutene. 4,320,232, Cl. 568-697.000.
Volkert, John K.: *See—*
Volkert, Robert B.; and Volkert, John K., 4,319,948, Cl. 156-357.000.
Volkert, Robert B.; and Volkert, John K. Card-affixing apparatus. 4,319,948, Cl. 156-357.000.
Volkswagenwerk Aktiengesellschaft: *See—*
Kruger, Hermann, 4,319,548, Cl. 123-90.270.
von Bonin, Wulf; Kleimann, Helmut; and Freitag, Hans-Albrecht, to Bayer Aktiengesellschaft. Process for the preparation of modified polyisocyanates. 4,320,067, Cl. 260-453.0AR.
von dem Bussche, Gotz; and Koblo, Jochen, to Hoechst Aktiengesellschaft. Process and apparatus for developing a two-component diazocopying material. 4,319,826, Cl. 354-299.000.
von Hagens, Gunther. Method for preserving large sections of biological tissue with polymers. 4,320,157, Cl. 428-13.000.
Voronin, Georgy A.: *See—*
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonova, Grigory V., deceased; Samsonova, Nadezhda A., administrator; Samsonova, Natalya G., administrator; and Samsonova, Evgeny G., administrator, 4,319,715, Cl. 239-81.000.
Vorwerk & Co. Interholding GmbH: *See—*
Simm, Hans-Peter; Guhne, Wieland; and Schlecht, Annegret, 4,319,380, Cl. 15-410.000.
Vratny, Frederick, to Bell Telephone Laboratories, Incorporated. Fabrication of palladium anode for X-ray lithography. 4,319,967, Cl. 204-29.000.
Vuilleumier, Cyril, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Attaching device of a dial on stationary parts of a timepiece movement. 4,320,483, Cl. 368-236.000.
Vyzkumny a vyvojovy ustav Zavodu: *See—*
Foltyn, Jan; Kuda, Vladimir; Vasicek, Vladimir; and Koci, Jaroslav, 4,319,611, Cl. 139-435.000.
WABCO Fahrzeugbremsen GmbH: *See—*
Gross, Friedrich; Meise, Guenther; and Unger, Herbert, 4,319,457, Cl. 60-593.000.
Lindemann, Klaus; Rode, Konrad; and Petersen, Erwin, 4,320,459, Cl. 364-426.000.
WABCO, Ltd.: *See—*
Smith, Eric G.; and Porteous, David A., 4,319,671, Cl. 188-196.00A.
Wada, Kouichi: *See—*
Matsumoto, Mutsumi; and Wada, Kouichi, 4,320,227, Cl. 562-534.000.
Waegaert, Pierre: *See—*
Leclerc, Jean-Francois; Paret, Jacques; and Waegaert, Pierre, 4,319,592, Cl. 131-365.000.
Waggener, William N., to Sangamo Weston, Inc. Adaptive differential PSK demodulator. 4,320,345, Cl. 329-50.000.
Waghorne, Robert H.; Gernand, Martin O.; and Pafford, Bernie J., to Exxon Research & Engineering Co. Magnetically stabilized bed, temperature, partial pressure swing, hydrogen recovery process. 4,319,892, Cl. 55-60.000.
Wagner, John J.: *See—*
Buford, William H., Jr.; and Wagner, John J., 4,320,298, Cl. 250-358.00R.
Wagner, Kuno: *See—*
Reischl, Artur; and Wagner, Kuno, 4,320,208, Cl. 521-102.000.
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Volkamer, Klaus; Lindner, Alfred; Merger, Franz; Wagner, Ulrich; Brunner, Erwin; Sandrock, Gerhard; and Strohmeyer, Max, 4,320,232, Cl. 568-697.000.

Wahl, Michael, to Marlboro Marketing, Inc. Adjustable marketing display device. 4,319,688, Cl. 211-175.000.

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D'Alelio, Gaetano F.; and Waitkus, Phillip A., 4,320,217, Cl. 526-285.000.

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Thissen, Christopher P.; Ferwerda, Jerry J.; Tweet, Milford J.; and Hatfield, Ronald D., 4,319,949, Cl. 156-446.000.

Wallace, Reuben H.: *See*—
Huckabay, John M.; and Wallace, Reuben H., 4,320,474, Cl. 367-138.000.

Walloschek, Bernhard: *See*—
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,319,736, Cl. 251-329.000.

Walser, Mackenzie, to Johns Hopkins University, The. Treatment of hepatic and renal disorders with ornithine and arginine salts of branched chain keto acids. 4,320,146, Cl. 424-319.000.

Walter Hofmann, Firma: *See*—
Hofmann, Frank, 4,319,717, Cl. 239-654.000.

Walton, Richard S.: *See*—
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Kempf, Mark F.; Randall, D'Arcy C.; and Walworth, Timothy R., 4,320,452, Cl. 364-200.000.

Warman, Bloomfield J. Compensation of transmission losses in a telephone system. 4,320,257, Cl. 179-16.00F.

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Ciaffone, John T., 4,319,399, Cl. 30-32.000.

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Watanabe, Mamoru, 4,319,669, Cl. 188-72.800.

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Watanabe, Masamichi; and Sakamoto, Seiji, to Diafoil Company Limited. Polyester film containing fine powder of crosslinked polymer. 4,320,207, Cl. 521-54.000.

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Oka, Hiroyuki; Watanabe, Shingo; Watanabe, Yusyo; and Kurata, Masayuki, 4,319,670, Cl. 188-73.340.

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Waterfield, Timothy O. W., 4,319,737, Cl. 251-331.000.

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Watts, Ridley, Jr., to Nordson Corporation. Film wrapping machine. 4,319,443, Cl. 53-466.000.

Way, Lee V., Jr. Magnet effected advancing toy. 4,319,427, Cl. 46-241.000.

Weaver, Gerald Q., to Norton Company. Sintered high density boron carbide. 4,320,204, Cl. 501-91.000.

Webb, Robert: *See*—
Cruickshank, David G.; and Webb, Robert, 4,320,281, Cl. 219-121.0LD.

Weber, Harold J., to Coulter Systems Corporation. Digitally synthesized dynamic bias method and apparatus for toning control in developing latent electrophotographic images. 4,319,544, Cl. 118-647.000.

Wecker, Ferdinand: *See*—
Benteler, Hubertus; Hansen, Rainer; Olszewski, Egon; and Wecker, Ferdinand, 4,319,471, Cl. 72-59.000.

Weidemuller, Wolf: *See*—
Piesch, Steffen; Engelhardt, Friedrich; Wille, Herbert; Weidemuller, Wolf; and Meyer, Artur, 4,320,060, Cl. 260-317.000.

Weirich, Walter; and Hennlich, Gunter, to Gewerkschaft Eisenhutte Westfalia. Hydraulic coupling device. 4,319,772, Cl. 285-26.000.

Weis, Martin; and Dumbs, Hermann, to ARENCO-BMD Maschinenfabrik GmbH. Cleaning machine for castings. 4,319,624, Cl. 164-401.000.

Weldon, William F., to Electric Power Research Institute, Inc. Brush actuation mechanism. 4,320,318, Cl. 310-219.000.

Wells, William A. Mop bucket connector. 4,319,761, Cl. 280-47.360.

Wengenroth, Kurt: *See*—
Wepner, Joachim; and Wengenroth, Kurt, 4,319,504, Cl. 83-157.000.

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West & Sons Engineers Limited: *See*—
Brown, John E., 4,319,756, Cl. 277-58.000.

Westercamp, Kenneth L.: *See*—
Hegler, Gary G.; and Westercamp, Kenneth L., 4,319,467, Cl. 64-32.00R.

Western Electric Company, Inc.: *See*—
Arroyo, Candido J.; Cogelia, Nicholas J.; and Darsey, Ralph J., 4,319,940, Cl. 156-56.000.
Cruickshank, David G.; and Webb, Robert, 4,320,281, Cl. 219-121.0LD.
Falanga, Bruno J.; and Macdonald, David I., 4,319,923, Cl. 75-108.000.
Franke, Edward L., Jr.; Hartranft, George E.; and Patel, Amrutlal D., 4,319,473, Cl. 72-196.000.
Fuchs, Francis J., Jr., 4,319,476, Cl. 72-272.000.
Gursky, Michael T.; and Pcihoda, William W., 4,320,192, Cl. 430-323.000.
Holman, James R.; and McIntyre, Robert N., 4,320,252, Cl. 174-21.00R.
Hynes, Roger P.; and Stackhouse, Karl A., 4,320,412, Cl. 357-70.000.
Macdonald, David I., 4,319,922, Cl. 75-108.000.

Western Geophysical Co. of America: *See*—
Montross, Edwin A., 4,320,468, Cl. 367-13.000.

Westinghouse Brake and Signal Co. Limited: *See*—
Wickham, David J., 4,319,787, Cl. 303-86.000.

Westinghouse Electric Corp.: *See*—
Bell, Clifford J., 4,320,431, Cl. 361-23.000.
Biter, William J., 4,320,154, Cl. 427-75.000.
Buck, Daniel C.; and Sinon, Gregory K., 4,320,399, Cl. 343-17.10R.
Carlson, Gerald L.; and Hickam, William M., 4,319,966, Cl. 204-1.00T.
Carroll, James C., 4,320,449, Cl. 363-135.000.
Coyle, Forrest E.; and Barkell, James W., Jr., 4,320,371, Cl. 335-256.000.
Fix, Paul; and Collins, Kent L., 4,319,906, Cl. 65-59.260.
Harrold, Ronald T., 4,320,035, Cl. 252-574.000.
Lanting, Richard J.; and Munsey, Robert J., 4,319,520, Cl. 98-37.000.
McCarthy, Charles C.; Ackman, Mark E.; Dufek, Wayne L.; and Kopicky, Edward E., 4,320,388, Cl. 340-825.540.
Meuschke, Robert E.; and Vandriak, Walter J., 4,319,725, Cl. 248-68.00R.
Zwillich, Alexander, 4,320,443, Cl. 362-375.000.

Weston Research Corporation: *See*—
Brown, William F., 4,319,925, Cl. 106-38.270.

Westvaco Corporation: *See*—
Osborne, Edward L., 4,319,710, Cl. 229-33.000.

Weyerhaeuser Company: *See*—
Dozier, Henry L.; and Williamson, John C., 4,319,878, Cl. 493-131.000.

Wheelabrator-Frye, Inc.: *See*—
Van Fossen, Harvey G., 4,319,436, Cl. 51-424.000.

Whirlpool Corporation: *See*—
Dingler, Geoffrey L.; Jarvis, Wilbur W.; and Spiegel, Raymond W., 4,319,598, Cl. 134-57.00D.
Dingler, Geoffrey L.; Jarvis, Wilbur W.; and Spiegel, Raymond W., 4,319,599, Cl. 134-104.000.

Whitaker, Gene C. Mud flap mounting device for trucks and trailers. 4,319,764, Cl. 280-154.000.

White, Abraham, deceased (by White, Edna, administrator); Nestor, John J.; Jones, Gordon H.; and Burton, Pamela M., to Syntex (U.S.A.) Inc. Deca-, undeca-, dodeca- and tridecapeptides with thymic activity. 4,320,118, Cl. 424-177.000.

White, Edna, administrator: *See*—
White, Abraham, deceased; Nestor, John J.; Jones, Gordon H.; and Burton, Pamela M., 4,320,118, Cl. 424-177.000.

White, Jack R.; Godwin, Charles L.; and Blattel, Raymond J., to United States of America, Navy. Precision laser pulse radiometer. 4,320,289, Cl. 250-214.00R.

White, Lawrence K.; and Wu, Chung P., to RCA Corporation. Method of forming polycrystalline silicon lines and vias on a silicon substrate. 4,319,954, Cl. 156-628.000.

White, Preston S., to Conoco Inc. Antifreeze formulation useful for retarding precipitation of aluminum corrosion products in the cooling systems of internal combustion engines. 4,320,023, Cl. 252-75.000.

White, Stoughton K. Collapsible lightweight bicycle fenders and method of attaching fenders to the bicycle frame. 4,319,763, Cl. 280-152.300.

White, William P. Lever type door handle. 4,319,470, Cl. 70-224.000.

Whitlock, Norris W. Personal liquid removal system. 4,319,573, Cl. 128-295.000.

Whittington, Lawrence E.: *See*—
Kudchadker, Mohan V.; and Whittington, Lawrence E., 4,319,636, Cl. 166-274.000.

Wickham, David J., to Westinghouse Brake and Signal Co. Limited. Rail vehicle braking apparatus. 4,319,787, Cl. 303-86.000.

Widlund, Leif U. R.; and Ternstrom, Maj I., to Molnlycke AB. Disposable diaper. 4,319,572, Cl. 128-284.000.

Wiedenmann, Hans-Martin: *See*—
Esper, Friedrich; and Wiedenmann, Hans-Martin, 4,320,080, Cl. 264-111.000.

Wiederkehr, Hermann, to Hoffmann-La Roche Inc. Ethynylation. 4,320,236, Cl. 568-813.000.

Wiederrich, LeRoy J., to Pollination Technics, Inc. Leafcutter bee nest. 4,319,371, Cl. 6-1.000.

Wiley, Emmett H., to General Electric Company. Compact lamp unit and socket. 4,319,796, Cl. 339-65.000.

Wiley, Emmett H., to General Electric Company. Compact lamp unit and socket. 4,320,439, Cl. 362-3.000.

Wilkes, Robert J.: *See*—
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Wilkesmann, Helmut: *See*—
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Wille, Herbert: *See*—
Piesch, Steffen; Engelhardt, Friedrich; Wille, Herbert; Weidemuller, Wolf; and Meyer, Artur, 4,320,060, Cl. 260-317.000.

Willers, Albertus V. Z.; and Neser, Willem J., to D.A.S. Pumps (Proprietary) Limited. Portable sprayer actuated by user's body movement. 4,319,699, Cl. 222-175.000.

William M. Bailey Company: *See*—
Skendrovic, Lawrence, 4,319,739, Cl. 266-280.000.

Williams, Albert M., to Technicolor Corporation. Audio-visual systems and methods. 4,319,812, Cl. 352-31.000.

Williams, Charles E., to Hester Industries, Inc. High humidity food chilling system. 4,319,460, Cl. 62-78.000.

Williams, James J., Jr.: *See*—
Dischert, Robert A.; Nagle, Eugene M.; and Williams, James J., Jr., 4,320,416, Cl. 358-133.000.

Williamson, John C.: *See*—
Dozier, Henry L.; and Williamson, John C., 4,319,878, Cl. 493-131.000.

Willke, Herbert L., Jr.: *See*—
Gorchev, Dimiter; Ingard, Karl U.; and Willke, Herbert L., Jr., 4,319,521, Cl. 98-38.00E.

Wilson, Darlene; Brown, Emmett J., Jr.; and Landry, Lawrence J., Jr., to Dow Chemical Company, The. Automatic colorimetric analyzer. 4,319,884, Cl. 23-230.00R.

Wilson, Michael L., to Armco Inc. Well tool orientation system with remote indicator. 4,319,637, Cl. 166-340.000.

Winchell, Frank J., to General Motors Corporation. Ostomy appliance. 4,319,571, Cl. 128-283.000.

Winckler, Peter S.: *See*—
Johnson, Roger R.; Kleinhagen, Charles W., Jr.; Neuman, Richard F.; and Winckler, Peter S., 4,319,668, Cl. 188-72.400.

Windrush Nominees Pty. Ltd.: *See*—
Macfarlane, Richard O., 4,319,538, Cl. 114-165.000.

Winkler, Joseph: *See*—
Gold, Marvin H.; and Winkler, Joseph, 4,319,886, Cl. 44-53.000.

Winnale, James A.: *See*—
Compeau, Edward E., deceased; and Winnale, James A., 4,319,769, Cl. 280-808.000.

Wirick, Michael P.: *See*—
Lund, Roger E.; and Wirick, Michael P., 4,320,462, Cl. 364-525.000.

Wise, James W., to Power Curbers, Inc. Ditch lining apparatus. 4,319,859, Cl. 405-268.000.

Wishman, Marvin, to Phillips Petroleum Company. Nonwoven fabric and method of production thereof. 4,320,167, Cl. 428-288.000.

Witte, Walter R., to RCA Corporation. Power transformer with high coupling coefficient. 4,320,373, Cl. 336-183.000.

Wolf, Klaus-Ullrich: *See*—
Ohlendorf, Heinrich-Wilhelm; Wolf, Klaus-Ullrich; Kaupmann, Wilhelm; and Heinemann, Henning, 4,320,061, Cl. 260-333.000.

Wolf, Robert, to J. M. Voith GmbH. Sag prevention means for a roller for the pressure treatment of webs of material. 4,319,390, Cl. 29-116.0AD.

Wolf, Walter; Nakamura, Robert M.; Gokce, Ata; Tubis, Manuel; and O'Brien, Timothy J., to University of Southern California, The. Immunoradiometric assay employing terminal radionuclide labeling and synthesis of conjugates for such assay. 4,320,109, Cl. 424-1.000.

Wolfle, Wilfried: *See*—
Bofinger, Gerhard; and Wolfle, Wilfried, 4,319,577, Cl. 128-305.100.

Wolter, Manfred; and Heymer, Gero, to Hoechst Aktiengesellschaft. Process for the removal of metals from carbon black. 4,320,108, Cl. 423-461.000.

Wood, Harry R.: *See*—
Black, James F.; Courtney, Richard A.; Grudkowski, Thomas W.; Norusis, Philip T.; and Wood, Harry R., 4,320,365, Cl. 333-187.000.

Woodbrey, James C.; and Moncur, Marlowe V., to Monsanto Company. High-impact polyamide molding resin compositions. 4,320,213, Cl. 525-179.000.

Woods, William E.; Stanley, Philip E.; and Hirsch, Thomas S., to Honeywell Information Systems Inc. Queue structure for a data processing system. 4,320,455, Cl. 364-200.000.

Woodward, Thomas R., to Burroughs Corporation. Self synchronizing clock derivation circuit for double frequency encoded digital data. 4,320,525, Cl. 375-110.000.

Wortley, John P. A., to IMI Kynoch Limited. Two-layer corrugated electrode. 4,319,977, Cl. 204-280.000.

Wright, John P.: *See*—
Crone, William J., Jr.; and Wright, John P., 4,319,991, Cl. 209-255.000.

Wright, William H.; and Kruse, John M., to C. W. Zumbiel Company, The. Compliance carrier. 4,319,682, Cl. 206-180.000.

Wu, Chung P.: *See*—
White, Lawrence K.; and Wu, Chung P., 4,319,954, Cl. 156-628.000.

Wulfsberg, Paul G.; Fredrickson, Dennis L.; Triplett, Gregory L.; Crumrine, Ralph J.; and Cunningham, Cole E. VHF-FM Frequency synthesizer. 4,320,357, Cl. 331-16.000.

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Machanian, William V., 4,319,509, Cl. 84-1.030.
Schwartz, Harold O.; Kidd, Dennis E.; and Hoskinson, William R., 4,319,508, Cl. 84-1.010.

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Wyland, Donald J.; and Stowe, Michael W., to Industrial Magnetics, Inc. Magnetic separator. 4,319,989, Cl. 209-225.000.

Wyss, Ulrich: *See*—
Tiefenthaler, Karl H. O.; and Wyss, Ulrich, 4,320,226, Cl. 536-114.000.

Xerox Corporation: *See*—
Rider, Ronald E., 4,320,420, Cl. 358-267.000.
Sawano, Takashi, 4,319,874, Cl. 432-60.000.
Thompson, Herbert E., 4,320,426, Cl. 360-104.000.

Yaffe, Roberta, to Texaco Inc. Synthetic aircraft turbine oil. 4,320,018, Cl. 252-46.700.

Yamada, Kei: *See*—
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Yamada, Shigemichi: *See*—
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Imai, Kazuhiro; Yamada, Shigemitsu; Kubota, Hidehiro; and Sakamaki, Jun, 4,319,883, Cl. 23-230.00B.

Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, to Nippon Soken, Inc. Knock detector device for internal combustion engines. 4,319,480, Cl. 73-35.000.

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Yamaguchi, Tetsuo: *See*—
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Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Endo, Yoshinori, 4,319,553, Cl. 123-432.000.
Kobayashi, Takashi, 4,319,656, Cl. 180-182.000.
Nomura, Kazuhiko, 4,319,657, Cl. 180-219.000.

Yamaki, Shoichi, to Fuji Electric Co., Ltd. Earth-leakage-current circuit breaker system. 4,320,433, Cl. 361-45.000.

Yamamichi, Masayoshi: *See*—
Iura, Yukio; Yamamichi, Masayoshi; Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, 4,319,814, Cl. 354-33.000.

Yamamoto, Kyukichi; Kurosawa, Masaji; and Matsui, Taro, to Nichias Corporation. Inorganic elastic foamed products and method of the preparation thereof. 4,320,202, Cl. 501-80.000.

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Yamanouchi, Roy K.: *See*—
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Yamasaki, Yasuo: *See*—
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Yamasu Shoyu Kabushiki Kaisha: *See*—
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Yamazaki, Shunpei. Semiconductor photoelectric conversion device. 4,320,248, Cl. 136-255.000.

Yamazaki, Shunpei. Heterojunction type semiconductor photoelectric conversion device. 4,320,249, Cl. 136-255.000.

Yanaga, Norihide, to Nissan Motor Co., Ltd. Fork rod slidably supporting device for transfer of vehicles. 4,319,496, Cl. 74-473.00R.

Yanagawa, Kaoru: *See*—
Hanma, Kentaro; and Yanagawa, Kaoru, 4,320,417, Cl. 358-227.000.

Yano, Shunji; and Takahashi, Tsunehisa, to Daiwa Can Company, Limited. Method for multi-stage washing. 4,319,930, Cl. 134-10.000.

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Yarwood, John C.: *See*—
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Yasuda, Yutaka: *See*—
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Yasui, Yasuyoshi: *See*—
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Yasukawa, Akio: *See*—
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Yaworsky, James J. Warfare simulating game apparatus. 4,319,754, Cl. 273-241.000.
Yelke, Edward. Clip-on piezoelectric transducer. 4,319,481, Cl. 73-119.00A.
Yevich, Joseph P.: *See*—
Temple, Davis L., Jr.; Yevich, Joseph P.; and Lobeck, Walter G., Jr., 4,320,131, Cl. 424-267.000.
Yializis, Angelo: *See*—
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Yokogawa Electric Works, Ltd.: *See*—
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Yokohama Rubber Co., Ltd., The: *See*—
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Yokota, Junichiro: *See*—
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Yonezawa, Kazuya; and Osawa, Tadashi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Polymerization of vinyl chloride with phenolic compounds. 4,320,215, Cl. 526-62.000.
Yoo, Jin S., to Atlantic Richfield Company. Passivation process. 4,319,983, Cl. 208-114.000.
Yoshida, Hiroshi, to Yoshida Kogyo, K.K. Slide fastener stringer. 4,319,387, Cl. 24-205.16R.
Yoshida Kogyo, K.K.: *See*—
Yoshida, Hiroshi, 4,319,387, Cl. 24-205.16R.
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Yoshikawa, Susumu, to Lion Corporation. Solid detergent composition. 4,320,033, Cl. 252-547.000.
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Yoshioka, Morihisa, to NTN Toyo Bearing Company, Ltd. Method for manufacturing an inner joint member of constant velocity joint. 4,319,478, Cl. 72-306.000.
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Young, Frank G., to Union Carbide Corporation. Preparation of aliphatic aldehydes from esters. 4,320,229, Cl. 568-484.000.
Young, Leroy. Row opening and row closing tool. 4,319,644, Cl. 172-375.000.
Youngdale, Ralph A., to Chrysler Corporation. Vehicle suspension strut. 4,319,768, Cl. 280-668.000.
Youngstown Steel Door Company, The: *See*—
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Yout, Pierre: *See*—
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Uramoto, Hiromu, 4,320,291, Cl. 250-227.000.
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Zahn, Irwin, to General Staple Company, Inc. Splice gun supply strip. 4,320,176, Cl. 428-573.000.
Zaiser, Wolfgang; and Elsner, Ernst, to Voith Getriebe KG. Securement of leaf springs in torsionally elastic coupling. 4,319,466, Cl. 64-27.00L.
Zdanys, John, Jr.: *See*—
Greve, James E.; and Zdanys, John, Jr., 4,320,267, Cl. 200-4.000.
Zellweger, Ltd.: *See*—
Roos, Gerold, 4,319,493, Cl. 73-828.000.
Zenith Radio Corporation: *See*—
Freers, Alan W.; and Pittenger, Daniel I., 4,320,349, Cl. 330-66.000.
Zenyaku Kogyo Kabushiki Kaisha: *See*—
Mitsuhashi, Hiroshi; Mizuno, Den-ichi; Hayashi, Koji; Abe, Shigeru; Takase, Muneaki; and Narita, Toshiharu, 4,320,120, Cl. 424-182.000.
Zernig, Ernst, to Richard Heinze GmbH & Co. KG. Cabinet furniture with hinged front door containing built-in appliance. 4,319,382, Cl. 16-251.000.
Ziebarth, Jurgen: *See*—
Hentschel, Bernhard; Ziebarth, Jurgen; Coenen, Alfred; Kosswig, Kurt; and Praun, Ferdinand V., 4,320,106, Cl. 423-424.000.
Ziegler, Eugene J.: *See*—
Lange, Harold T.; and Ziegler, Eugene J., 4,320,000, Cl. 210-117.000.
Zikakis, John P.: *See*—
Austin, Paul R.; Zikakis, John P.; and Brine, Charles J., 4,320,150, Cl. 426-2.000.
Zimmermann, Hans: *See*—
Nagel, Hartmut; Zimmermann, Hans; Pieper, Fritz; and Plage, Dieter, 4,319,744, Cl. 271-222.000.
Zinser Textilmaschinen GmbH: *See*—
Igel, Wolfgang, 4,319,450, Cl. 57-261.000.
Zoleski, Benjamin H.; Hebert, Gayle P.; Sung, Rodney L.; and Scarberry, Robert M., to Texaco Inc. Carbon dioxide-blown overbased calcium alkylphenolate lubricating compositions. 4,320,016, Cl. 252-42.700.
Zopfy, Rainer K.: *See*—
Cooley, Leslie F.; and Zopfy, Rainer K., 4,320,486, Cl. 369-14.000.
Zwillich, Alexander, to Westinghouse Electric Corp. Fauna guard. 4,320,443, Cl. 362-375.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF MARCH, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Buchnea, Alexander, to Sentrol Systems Ltd. On-line system for monitoring sheet material additives. Re. 30,884, Cl. 250-272.000.

Cook, William: *See*—
Huggett, Richard D. J.; and Cook, William, Re. 30,881, Cl. 254-345.000.

Heraeus Quarzscmelze GmbH: *See*—
Rau, Karlheinz; Simmat, Fritz; Muhlich, Albert; and Treber, Norbert, Re. 30,883, Cl. 65-60.510.

Huggett, Richard D. J.; and Cook, William, to Lewmar Marine Limited. Winch. Re. 30,881, Cl. 254-345.000.

Leavelle, Robert S. Pneumatic carrier with adjustable closure mechanism. Re. 30,882, Cl. 406-186.000.

Lewmar Marine Limited: *See*—
Huggett, Richard D. J.; and Cook, William, Re. 30,881, Cl. 254-345.000.

Muhlich, Albert: *See*—
Rau, Karlheinz; Simmat, Fritz; Muhlich, Albert; and Treber, Norbert, Re. 30,883, Cl. 65-60.510.

Rau, Karlheinz; Simmat, Fritz; Muhlich, Albert; and Treber, Norbert, to Heraeus Quarzscmelze GmbH. Method of producing synthetic quartz glass. Re. 30,883, Cl. 65-60.510.

Sentrol Systems Ltd.: *See*—
Buchnea, Alexander, Re. 30,884, Cl. 250-272.000.

Simmat, Fritz: *See*—
Rau, Karlheinz; Simmat, Fritz; Muhlich, Albert; and Treber, Norbert, Re. 30,883, Cl. 65-60.510.

Treber, Norbert: *See*—
Rau, Karlheinz; Simmat, Fritz; Muhlich, Albert; and Treber, Norbert, Re. 30,883, Cl. 65-60.510.

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Allen, John E. Design for electric cord reel. 263,371, 3-16-82, Cl. D8-358.000.

Allen, Robert K.: *See*—
Hicks, Alan A.; Disko, Harry; and Allen, Robert K., 263,401, Cl. D21-12.000.

Ament, Donald S.; and Ament, Duane S., to Miracle Recreation Equipment Company. Playground seating unit. 263,412, 3-16-82, Cl. D21-242.000.

Ament, Duane S.: *See*—
Ament, Donald S.; and Ament, Duane S., 263,412, Cl. D21-242.000.

American Microcar, Inc.: *See*—
Pivar, Stuart, 263,391, Cl. D12-85.000.

Anthos, S.A.: *See*—
Bvlgari, Gianni, 263,377, Cl. D10-39.000.

Arato, Paul T., to Barclay Rothschild Manufacturing Ltd. Compost bin. 263,365, 3-16-82, Cl. D34-1.000.

Aslanian, Jerry L., to Master Medical Corp. Arm support device for intravenous feeding. 263,423, 3-16-82, Cl. D24-64.000.

Barclay Rothschild Manufacturing Ltd.: *See*—
Arato, Paul T., 263,365, Cl. D34-1.000.

Bartscher, Franz, to Josef Schonlau, Maschinenfabrik-und Eisengiesserei. Floor panel for a pig shed. 263,428, 3-16-82, Cl. D30-2.000.

Beals, Matthew E., to Falcon Products Incorporated. Bench. 263,353, 3-16-82, Cl. D6-60.000.

Berman, Laurie. Combined carrying tray and sliding drawer. 263,430, 3-16-82, Cl. D34-44.000.

Bisbing, Robert H., to Southco, Inc. Hinge pin. 263,370, 3-16-82, Cl. D8-323.000.

Black & Decker Inc.: *See*—
Wagster, Robert P.; and Bunyea, Roderick F., 263,368, Cl. D8-74.000.

Blanchard, Steven D.: *See*—
Strenger, John R.; and Blanchard, Steven D., 263,366, Cl. D8-1.000.

Bruno, Robert H., to Stanley Works, The. Paint scraper handle. 263,364, 3-16-82, Cl. D32-48.000.

Bunyea, Roderick F.: *See*—
Wagster, Robert P.; and Bunyea, Roderick F., 263,368, Cl. D8-74.000.

Bvlgari, Gianni, to Anthos, S.A. Wrist watch. 263,377, 3-16-82, Cl. D10-39.000.

Cardinal American Corporation: *See*—
Sroub, Joseph W., 263,360, Cl. D6-179.000.

Chase, Richard A.; Williams, D. Michael; and Simpson, Danny E., to Johnson & Johnson Baby Products Company. Combined grasping and handling toy rattle or similar article. 263,405, 3-16-82, Cl. D21-65.000.

Chen, Yi. Game marker. 263,403, 3-16-82, Cl. D21-51.000.

Citizen Watch Co., Ltd.: *See*—
Fukumura, Yutaka, 263,378, Cl. D10-39.000.

Clark, Robin, to Hilary Page "Sensible" Toys Limited. Owl rattle. 263,404, 3-16-82, Cl. D21-65.000.

Cohen, Jacques. Sole for footwear. 263,348, 3-16-82, Cl. D2-322.000.

COP, Inc.: *See*—
Hillberg, Robert, 263,413, Cl. D22-1.000.

Custom Decor, Inc.: *See*—
Walker, George W., 263,385, Cl. D11-158.000.

Dare Pafco, Inc.: *See*—
Thurman, Paul G., 263,375, Cl. D34-43.000.

Davis, Stanley F., to Vitelle Holdings Limited. Billiard ball game target. 263,411, 3-16-82, Cl. D21-232.000.

Despard, Victor R., III, to Kaadan, Limited. Decorative oil lamp. 263,425, 3-16-82, Cl. D26-105.000.

Dietz, Henry G. Bathing suit. 263,349, 3-16-82, Cl. D2-41.000.

Disko, Harry: *See*—
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Dolan, John E. Deodorizer. 263,414, 3-16-82, Cl. D23-3.000.

Duclos, Clovis R. Golf putter head. 263,409, 3-16-82, Cl. D21-219.000.

Edgell, James E.: *See*—
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Energy Resource Systems, Inc.: *See*—
Keller, Frederick J.; and Horton, Walter G., 263,417, Cl. D23-86.000.

Ethyl Development Corporation: *See*—
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Falcon Products Incorporated: *See*—
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Fine, John W., Jr.: *See*—
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Firth Cleveland Limited: *See*—
McBrien, Roderick, 263,427, Cl. D28-13.000.

Fodor, William G.; and Edgell, James E., to Sandvik, Inc. Leaf rake head. 263,367, 3-16-82, Cl. D8-13.000.

Fukumura, Yutaka, to Citizen Watch Co., Ltd. Wrist watch. 263,378, 3-16-82, Cl. D10-39.000.

Gilford, Ira, to Reiner, Lawrence L. Toy dog in dog house. 263,407, 3-16-82, Cl. D21-161.000.

Gilson, Channing W., to Ovutron Corp. Ovulometer. 263,421, 3-16-82, Cl. D24-17.000.

Gingher, Clair H., Jr., to Gingher, Inc. Combined sheath and thread snips. 263,350, 3-16-82, Cl. D3-18.000.

Gingher, Inc.: *See*—
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Great State Productions, Inc.: *See*—
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Harvey, Thomas D.: *See*—
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Hay, Lorne E. Microwave detector. 263,380, 3-16-82, Cl. D10-78.000.

Hicks, Alan A.; Disko, Harry; and Allen, Robert K., to Marvin Glass & Associates. Dump truck toy with enclosure. 263,401, 3-16-82, Cl. D21-12.000.
Hilary Page "Sensible" Toys Limited: *See—*
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Hillberg, Robert, to COP, Inc. Handgun. 263,413, 3-16-82, Cl. D22-1.000.
Horikoshi, Shuzo; Kawamura, Ken; and Kobayashi, Shoichi, to Matsushita Electric Industrial Co., Ltd. Desk type business computer. 263,396, 3-16-82, Cl. D14-105.000.
Horton, Walter G.: *See—*
Keller, Frederick J.; and Horton, Walter G., 263,417, Cl. D23-86.000.
Howard, John R.; Machacek, Robert W.; and Fine, John W., Jr., to Ethyl Development Corporation. Bottle or similar article. 263,373, 3-16-82, Cl. D9-403.000.
Huddleston, Earl J.: *See—*
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Iwamoto, Masahiro. Combined toothpaste dispenser, toothbrush and tumbler holder. 263,355, 3-16-82, Cl. D6-87.000.
Jackson, Willie M. Photograph display tree. 263,362, 3-16-82, Cl. D6-234.000.
Johnson & Johnson Baby Products Company: *See—*
Chase, Richard A.; Williams, D. Michael; and Simpson, Danny E., 263,405, Cl. D21-65.000.
Johnson, Logan W.; Wenger, Jerry A.; and Tenner, Wayne V., to Wenger Corporation. Music stand top or similar article. 263,361, 3-16-82, Cl. D6-191.000.
Johnson, William H., to Shenandoah Manufacturing Co., Inc. Combined stove door supported thermostat and damper shielding housing with access shielding lower barrier. 263,420, 3-16-82, Cl. D23-137.000.
Jones, Linda M. Tampon dispenser. 263,354, 3-16-82, Cl. D6-86.000.
Josef Schonlau, Maschinenfabrik-und Eisengiesserei: *See—*
Bartscher, Franz, 263,428, Cl. D30-2.000.
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Kabushiki Kaisha Sato Kenkyusho: *See—*
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Karas, Joseph W.; Pfeifer, Robert F.; and Samson, Robert, to Motorola Inc. Multiple module serial link encryption unit or similar article. 263,395, 3-16-82, Cl. D14-100.000.
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Keller, Frederick J.; and Horton, Walter G., to Energy Resource Systems, Inc. Self-contained solid fuel boiler system. 263,417, 3-16-82, Cl. D23-86.000.
Kelley, Jerry K. Moisture alarm housing. 263,381, 3-16-82, Cl. D10-106.000.
Kinsell, William D., Jr., to SCM (Canada) Limited. Blank for a tear strip packaging container. 263,374, 3-16-82, Cl. D9-433.000.
Kobayashi, Shoichi: *See—*
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Koshino, Shinji, to Nihon Seimitsu Sokki Co., Ltd. Sphygmomanometer. 263,422, 3-16-82, Cl. D24-21.000.
Kuo, Chin-Tui. Pickaxe with a saw inside. 263,369, 3-16-82, Cl. D8-81.000.
Larrieu, Warren A. Game piece or similar article. 263,429, 3-16-82, Cl. D21-51.000.
Lash, Donald W., deceased; and by Lash, Gertrude, executrix, to Lash, Gertrude. Mobile rack for vertically supporting rolls of paper. 263,388, 3-16-82, Cl. D34-21.000.
Lash, Gertrude: *See—*
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Lash, Gertrude, executrix: *See—*
Lash, Donald W., deceased; and Lash, Gertrude, executrix, 263,388, Cl. D34-21.000.
Lasscock, Ian M. Material stacking bin for use with a pallet. 263,390, 3-16-82, Cl. D34-38.000.
Laurent, Thomas L. Lawn ornament. 263,386, 3-16-82, Cl. D11-159.000.
Lever Brothers Company: *See—*
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Lindmayer, Joseph, to Solarex Corporation. Solar cell. 263,393, 3-16-82, Cl. D13-4.000.
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Mansau, Serge, to Lever Brothers Company. Bottle or similar article. 263,372, 3-16-82, Cl. D9-400.000.
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McBrien, Roderick, to Firth Cleveland Limited. Hairdryer. 263,427, 3-16-82, Cl. D28-13.000.
McMeley, William J. Waist-mounted ball paddle. 263,408, 3-16-82, Cl. D21-213.000.
Metz, Thomas V.; and Sirois, W. James, to Pacific Fireplace Furnishings, Inc. Low profile fireplace heat exchanger. 263,418, 3-16-82, Cl. D23-95.000.
Metz, Thomas V.; and Sirois, W. James, to Pacific Fireplace Furnishings, Inc. Casting for low profile fireplace heat exchanger. 263,419, 3-16-82, Cl. D23-95.000.
Miracle Recreation Equipment Company: *See—*
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Monaco, Rosemarie. Combined attache case, handbag and pouch. 263,351, 3-16-82, Cl. D3-43.000.
Moore, Arnold P. Toy train whistle. 263,382, 3-16-82, Cl. D10-119.000.
Moore, Arnold P. Toy train whistle. 263,383, 3-16-82, Cl. D10-119.000.
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Muir, James H., to Video Turf Incorporated. One player video gambling machine. 263,402, 3-16-82, Cl. D21-13.000.
Myer, George L., to Kassnar Imports. Display unit for hand gun grips. 263,356, 3-16-82, Cl. D6-151.000.
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Nordstrom, Claes. Pallet. 263,389, 3-16-82, Cl. D34-38.000.
Orenstein, Henry. Simulative driving toy. 263,406, 3-16-82, Cl. D21-142.000.
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Parrish, Alonzo, III. Combined stackable cabinet and shelf unit or the like. 263,359, 3-16-82, Cl. D6-169.000.
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Roche, Charles W., to Uni-Flange Corporation. Pipe coupling adapter flange. 263,415, 3-16-82, Cl. D23-43.000.
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Siegel, Alan G. Musical instrument stand. 263,352, 3-16-82, Cl. D6-20.000.
Silverman, Cindy. Skate cover. 263,346, 3-16-82, Cl. D2-272.000.
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Uchiyama, Hiroo. Magnetic compass. 263,379, 3-16-82, Cl. D10-68.000.
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Bailey, Dorothy J. S., to San Joaquin Rose Co. Rose plant. 4,830, 3-16-82, Cl. 11.000.
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CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

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526 4,319,880
532 4,319,881

CLASS 12

8.3 4,319,373

CLASS 13

6 4,320,244
12 4,320,245

CLASS 14

1 4,319,374
2.4 4,319,375
71.5 4,319,376

CLASS 15

111 4,319,377
162 4,319,378
400 4,319,379
410 4,319,380

CLASS 16

44 4,319,381
251 4,319,382

CLASS 17

1 E 4,319,383

CLASS 23

230 B 4,319,882
4,319,883
230 R 4,319,884

CLASS 24

3 R 4,319,384
20 R 4,319,385
164 4,319,386
205.16 R 4,319,387

CLASS 28

257 4,319,388

CLASS 29

116 AD 4,319,389
4,319,390
157.1 R 4,319,391
402.08 4,319,392
434 4,319,393
564.4 4,319,394
571 4,319,395
4,319,396
589 4,319,397
598 4,319,398

CLASS 30

32 4,319,399

CLASS 33

169 C 4,319,400
174 B 4,319,401
180 AT 4,319,402
185 R 4,319,403
263 4,319,404
292 4,319,405
295 4,319,406

CLASS 34

1 4,319,407
15 4,319,408
58 4,319,409
75 4,319,410
233 4,319,411

CLASS 36

29 4,319,412
57 4,319,413

CLASS 37

58 4,319,414
67 4,319,415
104 4,319,416

CLASS 40

10 R 4,319,417
124.1 4,319,418
152.1 4,319,419
156 4,319,420
617 4,319,421
622 4,319,422

CLASS 43

121 4,319,423

CLASS 44

15 R 4,319,885
53 4,319,886
72 4,319,887

CLASS 46

12 4,319,424
43 4,319,425
200 4,319,426
241 4,319,427

CLASS 47

42 4,319,428

CLASS 48

77 4,319,888

CLASS 49

220 4,319,429
404 4,319,430
426 4,319,431

CLASS 51

131.4 4,319,432
170 PT 4,319,433
177 4,319,434
307 4,319,889
421 4,319,435
424 4,319,436

CLASS 52

220 4,319,437
221 4,319,438
288 4,319,439
438 4,319,440

CLASS 53

131 4,319,441
447 4,319,442
466 4,319,443
569 4,319,444

CLASS 55

1 4,319,890
15 4,319,891
60 4,319,892
4,319,893
71 4,319,894
73 4,319,895
213 4,319,896
302 4,319,897
322 4,319,898
416 4,319,899

CLASS 56

63 4,319,445
341 4,319,446

CLASS 57

6 4,319,447
58.89 4,319,448
4,319,449
261 4,319,450

CLASS 60

274 4,319,451
293 4,319,452
309 4,319,453
506 4,319,454
547 R 4,319,455
562 4,319,456
593 4,319,457
693 4,319,458

CLASS 62

42 4,319,900
77 4,319,459
78 4,319,460
93 4,319,461
235 4,319,462
256 4,319,463
371 4,319,464

CLASS 64

21 4,319,465
27 L 4,319,466
32 R 4,319,467

CLASS 65

2 4,319,901
4.21 4,319,902
27 4,319,903
4,319,904
31 4,319,905
59.26 4,319,906
60.51 Re.30,883
106 4,319,907
182.5 4,319,908
331 4,319,909

CLASS 66

203 4,319,468
207 4,319,469

CLASS 70

224 4,319,470

CLASS 71

27 4,319,910
76 4,319,911
86 4,319,912
4,319,913
90 4,319,914
92 4,319,915
94 4,319,916
105 4,319,917
118 4,319,918
124 4,319,919

CLASS 72

59 4,319,471
122 4,319,472
196 4,319,473
229 4,319,474
234 4,319,475
272 4,319,476
306 4,319,478
352 4,319,477

CLASS 73

19 4,319,479
35 4,319,480
119 A 4,319,481
153 4,319,482
204 4,319,483
304 C 4,319,484
336 4,319,485
343 B 4,319,486
384 4,319,487
509 4,319,488
626 4,319,489
642 4,319,490
662 4,319,491
756 4,319,492
828 4,319,493
862.23 4,319,494

CLASS 74

405 4,319,495
473 R 4,319,496
512 4,319,497
595 4,319,498
700 4,319,499
720 4,319,500
866 4,319,501

CLASS 75

0.5 A 4,319,920
65 R 4,319,921
108 4,319,922
4,319,923

CLASS 76

25 A 4,319,502

CLASS 82

4 C 4,319,503

CLASS 83

157 4,319,504
295 4,319,505
347 4,319,506
694 4,319,507

CLASS 84

1.01 4,319,508
1.03 4,319,509
1.15 4,319,510
1.22 4,319,511
318 4,319,512
348 4,319,513
421 4,319,514
454 4,319,515

CLASS 91

420 4,319,516

CLASS 92

128 4,319,517
241 4,319,518

CLASS 98

2.11 4,319,519
37 4,319,520
38 E 4,319,521

CLASS 100

162 B 4,319,522

CLASS 101

3 R 4,319,523
128 4,319,524
350 4,319,525

CLASS 102

310 4,319,526
314 4,319,527

CLASS 105

397 4,319,528

CLASS 106

14.12 4,319,924
38.27 4,319,925
74 4,319,926
89 4,319,927

CLASS 108

51.3 4,319,529
4,319,530
152 4,319,531

CLASS 112

79.5 4,319,532
158 E 4,319,533

CLASS 114

39 4,319,534
91 4,319,535
99 4,319,536
112 4,319,537
165 4,319,538
219 4,319,539
260 4,319,540

CLASS 116

318 4,319,541

CLASS 118

100 4,319,542
503 4,319,543
647 4,319,544

CLASS 119

17 4,319,545

CLASS 123

19 4,319,546
41.29 4,319,547
90.27 4,319,548
198 DB 4,319,550
198 E 4,319,549
245 4,319,551
297 4,319,552
432 4,319,553
559 4,319,554

CLASS 126

60 4,319,555
77 4,319,556
110 R 4,319,557
121 4,319,558
442 4,319,559
450 4,319,560
452 4,319,561

CLASS 127

46.2 4,319,928
4,319,929

CLASS 128

1 R 4,319,562
6 4,319,563
87 R 4,319,565
203.26 4,319,566
206.19 4,319,567
214 F 4,319,568
241 4,319,569
278 4,319,570
283 4,319,571
284 4,319,572
295 4,319,573
303 R 4,319,574
305 4,319,575
4,319,576
305.1 4,319,577
635 4,319,578
640 4,319,579
661 4,319,580
707 4,319,581
766 4,319,582
774 4,319,564
775 4,319,583
789 4,319,584

CLASS 131

270 4,319,587
275 4,319,585
276 4,319,586
280 4,319,588
281 4,319,589
331 4,319,590
359 4,319,591
365 4,319,592
372 4,319,593

CLASS 132

11 R 4,319,594
73.6 4,319,596
92 R 4,319,595

CLASS 133

8 A 4,319,597

CLASS 134

10 4,319,930
57 D 4,319,598
104 4,319,599

CLASS 135

20 M 4,319,600

CLASS 136

248 4,320,246
255 4,320,247
4,320,248
4,320,249
256 4,320,250
4,320,251

CLASS 137

124 4,319,601
202 4,319,602
492.5 4,319,603
498 4,319,604
590 4,319,605
625.3 4,319,606
625.48 4,319,608
625.5 4,319,607
625.63 4,319,609

CLASS 138

131 4,319,610

CLASS 139

435 4,319,611

CLASS 141

1 4,319,612
39 4,319,613
381 4,319,614

CLASS 144

144 R 4,319,615
326 R 4,319,931

CLASS 148

1.5 4,319,932
9 R 4,319,933
12 F 4,319,934
32 4,319,935
111 4,319,936
171 4,319,937

CLASS 150

1.5 C 4,319,616
52 R 4,319,617

CLASS 152

185 4,319,618
209 R 4,319,619
4,319,620
362 CS 4,319,621
362 R 4,319,622

CLASS 156

49 4,319,938
56 4,319,939
4,319,940
61 4,319,941
72 4,319,942
136 4,319,943
195 4,319,944
212 4,319,945
350 4,319,946
351 4,319,947
357 4,319,948
446 4,319,949
475 4,319,950
502 4,319,951
510 4,319,952
608 4,319,953
628 4,319,954
659.1 4,319,955

CLASS 160

90 4,319,623

CLASS 162

146 4,319,956
352 4,319,957

CLASS 164

401 4,319,624
467 4,319,625

CLASS 165

1 4,319,626
4,319,627
39 4,319,628
47 4,319,629
70 4,319,630
76 4,319,631

CLASS 166

60 4,319,632
250 4,319,633
4,319,634
263 4,319,635
274 4,319,636
340 4,319,637
355 4,319,638
377 4,319,639

CLASS 169

28 4,319,640

CLASS 171

63 4,319,641

CLASS 172

13 4,319,642
311 4,319,643
375 4,319,644
664 4,319,645

CLASS 173

111 4,319,646

CLASS 174

21 R 4,320,252
138 J 4,320,253

CLASS 175

14 4,319,647
53 4,319,648
73 4,319,649

CLASS 177

156 4,319,650
229 4,319,651
255 4,319,652

CLASS 179

1 G 4,320,255
1 VL 4,320,254
6.04 4,320,256
16 F 4,320,257
18 B 4,320,258
18 FA 4,320,260
18 FG 4,320,259
98 4,320,261
103 4,320,262
115.5 R 4,320,264
115.5 VC 4,320,263
170 R 4,320,265

CLASS 180

89.17 4,319,653
155 4,319,654
165 4,319,655
182 4,319,656
219 4,319,657
271 4,319,658
4,319,659

CLASS 181

222 4,319,660
295 4,319,661

CLASS 182

13 4,319,662
154 4,319,663

CLASS 184

1.5 4,319,664

CLASS 187

29 R 4,319,665
43 4,319,666

CLASS 188

65.1 4,319,667
72.4 4,319,668
72.8 4,319,669
73.34 4,319,670
196 A 4,319,671

CLASS 192

0.02 R 4,319,672
4 R 4,319,673

CLASS 194

4,319,674

CLASS 196

14.5 4,319,962

CLASS 198

367 4,319,675
449 4,319,676
585 4,319,677
746 4,319,678

CLASS 200

4 4,320,266
4,320,267
5 A 4,320,268
144 B 4,320,269
148 A 4,320,270
277 4,320,271
317 4,320,272

CLASS 202

170 4,319,963
172 4,319,964
205 4,319,965

CLASS 204

1 T 4,319,966
29 4,319,967
96 4,319,968
98 4,319,969
106 4,319,970
109 4,319,971
129.43 4,319,972
133 4,319,973
159.11 4,319,974
180 G 4,319,975
4,319,976
280 4,319,977
301 4,319,978
302 4,319,979

CLASS 206

0.5 4,319,679
45.14 4,319,680
45.19 4,319,681
180 4,319,682
349 4,319,683
464 4,319,684
507 4,319,685

CLASS 208

8 LE 4,319,980
8 R 4,319,981
11 R 4,319,982
114 4,319,983
138 4,319,984

CLASS 209

3 4,319,985
166 4,319,987
172.5 4,319,988
225 4,319,989
240 4,319,990
255 4,319,991
275 4,319,992
315 4,319,993
447 4,319,994
481 4,319,995

CLASS 210

85 4,319,997
86 4,319,998
95 4,319,999
117 4,320,000
120 4,320,001
178 4,320,002
188 4,319,996
222 4,320,003
232 4,320,005
266 4,320,004
369 4,320,006
376 4,320,007
527 4,320,008
651 4,320,009
662 4,320,010
694 4,320,011
713 4,320,012

CLASS 211

60 SK 4,319,686
105.2 4,319,687
175 4,319,688
182 4,319,689

CLASS 215

220 4,319,690

CLASS 219

10.49 R 4,320,273
10.55 B 4,320,275
10.55 E 4,320,274
10.81 4,320,276
61 4,320,277
69 G 4,320,278
69 P 4,320,279
69 W 4,320,280
121 LD 4,320,281
137 PS 4,320,282
369 4,320,283
469 4,320,284
497 4,320,285
549 4,320,286

CLASS 220

90.4 4,319,691
268 4,319,692
373 4,319,693
407 4,319,694

CLASS 221

213 4,319,695
310 4,319,696

CLASS 222

80 4,319,697
129.1 4,319,698
175 4,319,699
511 4,319,700
541 4,319,701

CLASS 223

38 4,319,702
106 4,319,703

CLASS 224

270 4,319,704

CLASS 227

120 4,319,705
126 4,319,706

CLASS 228

46 4,319,707
111 4,319,708
213 4,319,709

CLASS 229

33 4,319,710

CLASS 235

412 4,320,287

CLASS 236

46 R 4,319,711
47 4,319,712
96 4,319,713
99 G 4,319,714

CLASS 239

81 4,319,715
102 4,319,716
654 4,319,717

CLASS 241

101.2 4,319,718
183 4,319,719

CLASS 242

35.5 R 4,319,720
107.4 A 4,319,721

CLASS 244

116 4,319,722
122 A 4,319,723

CLASS 248

49 4,319,724
68 R 4,319,725
97 4,319,726
149 4,319,727
154 4,319,728
188.7 4,319,729
220.4 4,319,730
223.4 4,319,731
346 4,319,732
507 4,319,733

CLASS 250

203 R 4,320,288
214 R 4,320,289
216 4,320,290
227 4,320,291
4,320,292
231 P 4,320,294
231 SE 4,320,293
272 Re.30,884
281 4,320,295
327.1 4,320,296
343 4,320,297
358 R 4,320,298
374 4,320,299
423 P 4,320,300
578 4,320,302

CLASS 251

174 4,319,734
175 4,319,735
329 4,319,736
331 4,319,737

CLASS 252

8.55 C 4,320,014
8.8 4,320,013
33.6 4,320,015
42.7 4,320,016
43 4,320,017
46.7 4,320,018
51.5 A 4,320,019
51.5 R 4,320,020
4,320,021
62.59 4,320,022
75 4,320,023
78.3 4,320,024
78.5 4,320,025
139 4,320,026
188 4,320,027
428 4,320,029
432 4,320,030
4,320,031
455 R 4,320,032
547 4,320,033
567 4,320,034
574 4,320,035
628 4,320,028

CLASS 254

89 R 4,319,738
345 Re.30,881

CLASS 260

112 R 4,320,050
112.5 E 4,320,051
112.5 R 4,320,052
4,320,053
4,320,054
239.1 4,320,055
239.3 B 4,320,057
239.3 T 4,320,056
244.4 4,320,058
314.5 4,320,059
317 4,320,060
333 4,320,061
343.6 4,320,062
404.5 4,320,063
429 R 4,320,064
438.5 R 4,320,065
439 CY 4,320,066
453 AB 4,320,068
453 AR 4,320,067
453 SP 4,320,069
455 A 4,320,070
464 4,320,071

CLASS 261

111 4,320,072
112 4,320,073

CLASS 264

8 4,320,074
32 4,320,075
35 4,320,076
40.6 4,320,077
73 4,320,078
102 4,320,079
111 4,320,080
184 4,320,081
257 4,320,082
531 4,320,083
540 4,320,084

CLASS 266

280 4,319,739

CLASS 271

22 4,319,740
118 4,319,741
4,319,742
184 4,319,743
222 4,319,744
305 4,319,745

CLASS 272

30 4,319,746
73 4,319,747
93 4,319,748
146 4,319,749

CLASS 273

80 B 4,319,750
85 E 4,319,751
171 4,319,752
201 4,319,753
241 4,319,754
401 4,319,755

CLASS 277

58 4,319,756
81 R 4,319,757
205 4,319,758

CLASS 280

11.115 4,319,760
11.2 4,319,759
47.36 4,319,761
79.2 4,319,762
152.3 4,319,763
154 4,319,764
504 4,319,765
511 4,319,766
614 4,319,767
668 4,319,768
808 4,319,769
824 4,319,770

CLASS 283

2 4,319,771

CLASS 285

26 4,319,772
137 A 4,319,773
256 4,319,774
383 4,319,775

CLASS 290

1 R 4,320,303
55 4,320,304

CLASS 292

322 4,319,776

CLASS 296

64 4,319,777
166 4,319,778

CLASS 297

19 4,319,779
85 4,319,780
214 4,319,781

CLASS 299

1 4,319,782
43 4,319,783
64 4,319,784

CLASS 301

6 CS 4,319,785

CLASS 303

6 C 4,319,786
86 4,319,787

CLASS 307

6 4,320,305
51 4,320,306
91 4,320,307
106 4,320,308
132 T 4,320,309
141 4,320,310
147 4,320,311
238.8 4,320,312
243 4,320,313
288 4,320,314
454 4,320,315
595 4,320,316

CLASS 308

72 4,319,788
207 R 4,319,789
238 4,319,790

CLASS 310

68 B 4,320,317
219 4,320,318
266 4,320,319
361 4,320,320

CLASS 312

239 4,319,791
245 4,319,792
257 R 4,319,793
293 4,319,794
330 R 4,319,795

CLASS 313

209 4,320,321
217 4,320,322
330 4,320,323
493 4,320,324

CLASS 315

205 4,320,325
307 4,320,326

CLASS 318

50 4,320,327
431 4,320,328
443 4,320,329
685 4,320,330
722 4,320,331
798 4,320,332

CLASS 320

43 4,320,333
48 4,320,334
59 4,320,335

CLASS 323

324 4,320,336
358 4,320,337

CLASS 324

60 C 4,320,338
73 AT 4,320,339
221 4,320,340
248 4,320,341
319 4,320,342
450 4,320,343
451 4,320,344

CLASS 329

50 4,320,345
101 4,320,346

CLASS 330

9 4,320,347
52 4,320,348
66 4,320,349
202 4,320,350
260 4,320,351
277 4,320,352
286 4,320,353
306 4,320,354

CLASS 331

2 4,320,355
11 4,320,356
16 4,320,357
172 4,320,360

CLASS 332

16 R 4,320,361

CLASS 333

165 4,320,362
4,320,363
167 4,320,364
187 4,320,365
197 4,320,366
209 4,320,367
4,320,368

CLASS 335

202 4,320,369
208 4,320,370
256 4,320,371

CLASS 336

92 4,320,372
183 4,320,373

CLASS 337

162 4,320,374
204 4,320,375
252 4,320,376
278 4,320,377

CLASS 338

21 4,320,379
34 4,320,378

CLASS 339

65 4,319,796
75 R 4,319,797
154 R 4,319,798
217 R 4,319,799
218 R 4,319,800

CLASS 340

39 4,320,380
52 F 4,320,381
64 4,320,382
71 4,320,383
4,320,384
133 4,320,385
347 NT 4,320,390
347 SY 4,320,391
365 C 4,320,392
600 4,320,393
618 4,320,394
726 4,320,395
799 4,320,396
825.22 4,320,386
825.3 4,320,389
825.34 4,320,387
825.54 4,320,388

CLASS 343

7.5 4,320,397
8 4,320,398
17.1 R 4,320,399
100 CL 4,320,400
700 MS 4,320,401
4,320,402
756 4,320,403
854 4,320,404

CLASS 346

140 A 4,320,405
140 R 4,320,406
4,320,407
159 4,320,408

CLASS 350

6.4 4,319,807
19 4,319,801
96.20 4,319,802
96.33 4,319,803
102 4,319,804
120 4,319,805
281 4,319,806
358 4,319,808
464 4,319,809
469 4,319,810

CLASS 351

166 4,319,811

CLASS 352

31 4,319,812

CLASS 354

25 4,319,813
33 4,319,814
56 4,319,816
59 4,319,815
127 4,319,817
145 4,319,818
154 4,319,819
187 4,319,820
230 4,319,821
234 4,319,822
4,319,823
272 4,319,824
293 4,319,825
299 4,319,826
304 4,319,827

CLASS 355

1 4,319,830
3 BE 4,319,829
3 R 4,319,828
15 4,319,831
4,319,832
23 4,319,833
35 4,319,834
50 4,319,835
55 4,319,836
73 4,319,837

CLASS 356

152 4,319,838
153 4,319,839
241 4,319,840
244 4,319,841
317 4,319,842
346 4,319,843
399 4,319,844
400 4,319,845
401 4,319,846
431 4,319,847

CLASS 357

42 4,320,409
43 4,320,410
50 4,320,411
70 4,320,412

CLASS 358

44 4,320,413
51 4,320,414
105 4,320,415
133 4,320,416
227 4,320,417
240 4,320,418
258 4,320,419
267 4,320,420

CLASS 360

60 4,320,421
4,320,422
72.2 4,320,423
96.5 4,320,424
97 4,320,425
104 4,320,426
122 4,320,427
123 4,320,428
130.34 4,320,429
133 4,320,430

CLASS 361

23 4,320,431
39 4,320,432
45 4,320,433
86 4,320,434
119 4,320,435
128 4,320,436
303 4,320,437
401 4,320,438

CLASS 362

3 4,320,439
13 4,320,440
65 4,320,441
301 4,320,442
375 4,320,443

CLASS 363

35 4,320,444
54 4,320,445
59 4,320,446
63 4,320,447
134 4,320,448
135 4,320,449

CLASS 364

200 4,320,450
4,320,451
4,320,452
4,320,453
4,320,454
4,320,455
4,320,456
4,320,457
422 4,320,458
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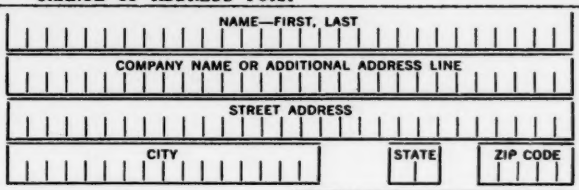

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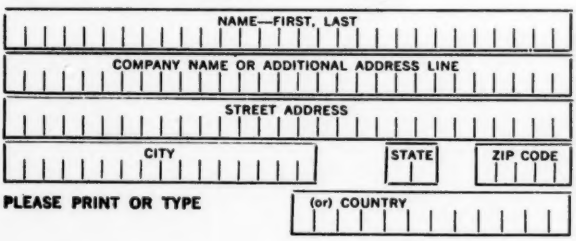

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